

VOLUME VIII

NO. 1

WESTERN INDUSTRIES



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EDITORIAL COMMENT

(Communications on any subject of interest to our readers are welcomed. If author wishes, his name will not be used. Unsigned contributions will be disregarded.)

An Industrial Revolution

THE West is, in effect, experiencing an industrial revolution superimposed on an industrial revolution, William K. Hopkins, regional director of the War Manpower Commission, told the California State Chamber of Commerce convention at Los Angeles last month. To be sure, he only mentioned California, but the changes he outlined apply to the rest of the Western states.

While the value of manufactured products in the nation as a whole increased 150 per cent between 1914 and 1939, he said, the value of such products in California increased 326 per cent—more than twice the average increase for the nation. In that same period the number of wage earners in all manufacturing industries increased 131.6 per cent in California, compared with 21.7 per cent in the nation as a whole—more than six times the national average.

Conversion of industries to a wartime basis resulted in other industries springing up, and where hundreds had been employed, thousands were hired and more thousands needed.

Today there are more industrial wage earners in Los Angeles County alone than there were in the entire state at any time in 1939 and more than in any month in 1940 except August when canning reached its seasonal peak.

In 1939 there was an average of 381,000 industrial wage earners employed in manufacturing in California. In September this year there were approximately 955,000.

Because of various factors, including the availability of existing plants, the first impact of the war on industry was felt most keenly by Pacific Coast states. From November 30, 1941, a week before Pearl Harbor, to July 1, 1942 the states of the twelfth region of the War Manpower Commission received approximately 10 billion dollars worth of supply and facility contracts, of a total of 77 and a half billions in the nation. And that figure does not include contracts awarded for foodstuffs.

Approximately 25 per cent of contracts for shipyards—excluding Navy yards—and for aircraft came to Pacific Coast states. For months it was generally recognized that California led all states in the amount of war contracts. While immediate statistics are not available, said Mr. Hopkins, there is little doubt that, when we include the huge contribution California is making toward feeding the allied nations, the state's total contribution to the war is second to none.

Experience Gained at High Speed

WAR is fluid. Consequently demands are fluid. When defense against night air raids is being built up, supplies of one kind are needed; after a reserve has been accumulated, the need is for something else. The failure of the German daylight raids over England in 1940 lessened the call for materiel for daylight defenses and daylight attack until the Flying Fortresses brought daylight attacks back into the picture—with the Allies doing the attacking.

So the frequent cancellations of Army and Navy contracts do not mean uncertainty or indecision on the part of those directing the armed forces. They merely signify the fluidity of war and the rapid changes resulting from the development of technical knowledge based on experience in action. Each battleground is a proving ground, a pilot plant and a "test sales campaign" all rolled into one, with the results made obvious in far shorter time than is possible in peace-time experience.

WESTERN INDUSTRY

News, Methods, Solutions to Problems of the Primary Manufacturing and Processing Industries of the West

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OUR COVER PICTURE

• Potash storage facilities of the American Potash & Chemical Corporation at Trona, California, shown here, will accommodate 500,000 tons trimmed, i. e., shifted and piled by machine and hand labor. But so great has been the demand from war industries and for production that this vast storage space is practically empty, and the company virtually "loads from production."



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**"WHO'D HAVE
THOUGHT THE END
OF A PIN COULD
KEEP ME
HAPPY!"**



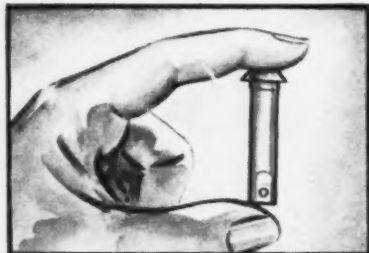
① IT WAS BACK IN 1939—We had to put a new drive on one of our machines over in the part of the plant we called the "dust bowl." We decided to try a chain belt to see if we could get a more positive drive. It looked as though it would stand the gaff, but I was a bit cynical.

② WE WORKED IT NIGHT AND DAY—It ever a drive took punishment, that new chain belt did. We kept the machine going continuously under the worst possible abrasive conditions. The boys hardly had a chance to keep the chain oiled. It sure looked good, but I kept my fingers crossed.

③ AND STILL NOTHING HAPPENED—That chain belt kept right on running as smooth as silk. It got to be nothing unusual for it to be on the job 20 hours a day—what with the rush of war production. Honestly that machine got to be the talk of the plant. The boys called it Old Faithful.



④ SO I ASKED THE REX MAN FOR the secret—"Why is it," I said, "that this Rex Chabelco chain belt is giving us so much better service than any of our others? Do you Chain Belt fellows have a better way of making things than other folks? What's the secret, anyway?"



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⑥ WOUND UP WITH THIS DIAGRAM—This Rex man admitted that other things besides the pin made this chain so great—side bars of a special steel, bushings case-hardened, and on and on. I was sold to the hilt on this chain. They know how to make things at Chain Belt!

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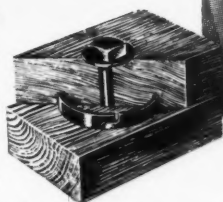
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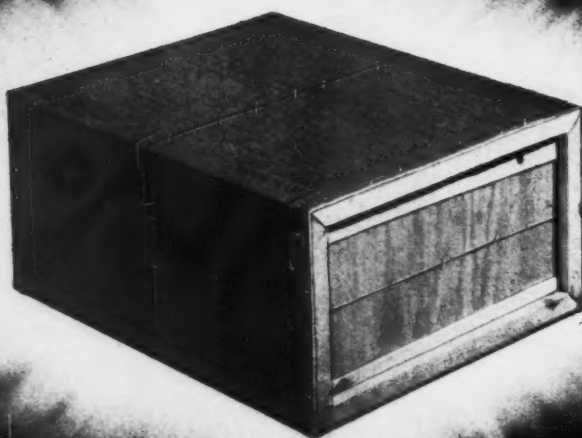
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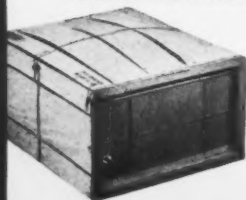


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Spotlight

on the NEWS

WESTERN INDUSTRY
FOR JANUARY, 1943

VOLUME VIII

NUMBER 1

Survey of California's Progress Shows War Supplies Contracts Past \$7,000,000,000 Mark

CONTRACTS for war supplies awarded to California industries passed the \$7,000,000,000 mark during 1942. Employment in manufacturing industries, at the end of the year, approximated nearly a million workers, or three times as large as the average for the census year of 1939.

The 1942 payroll of factory wage earners alone is estimated for the current year at \$1,350,000,000, approximately twice the factory payroll of 1941; and the total of individual incomes for Californians during the current year, according to preliminary estimates, will approximate \$8,500,000,000, or 25 per cent higher than last year.

These facts, reviewing California's progress, are brought out in a preliminary survey for 1942, just completed by the Research Department of the California State Chamber of Commerce.

With reference to employment in manufacturing industries of the State, the report shows that there has been a net addition of 291,000 new employees during the current year, an average of about 24,000 per month, principally in the rapidly expanding aircraft, shipbuilding and other war material industries.

Impetus of the Food For Victory program is indicated by the fact that gross income of farmers, according to preliminary estimates, will exceed \$1,250,000,000, or about 50 per cent above the 1941 total.

Production of crude petroleum has been at slightly higher levels than in 1941, when California production amounted to 230,000,000 barrels, with a value of \$219,000,000. Employment declined in metal mining during the year, principally because of decreased activity in gold mining, but

production of quicksilver, tungsten, and cromite increased considerably.

Population of California increased between 200,000 and 250,000 during the current year, bringing the total resident civilian population to more than 7,500,000 according to unofficial estimates. Since the April 1940 census, California's population has increased approximately 600,000. The flow of population to the war production centers and military areas has resulted in shortages of housing and other facilities.

Private residential, highway, and other public construction have dropped sharply during the year, although construction of

new industrial plants and army facilities have resulted in a large volume of new construction work. A large portion of the Federal allocation of \$608,000,000 for construction of new industrial plant facilities, and also a considerable part of the \$742,000,000 for army and navy facilities was expended during the current year.

Phoenix Rubber Factory

Goodyear Aircraft Corporation's original investment of \$750,000 in a factory west of Phoenix, Ariz., is being expanded to \$9,000,000, according to testimony of President Litchfield before the Arizona Corporation Commission. In addition to manufacturing flight decks for navy patrol

• Salvage program explained over the luncheon table in San Francisco by Paul J. Cabot, Deputy Director Conservation Division, WPB. Left to right, clockwise: L. Edward Scriven, Chief Deputy Director, WPB; James Mussatti, Genl. Mgr. Calif. State Chamber of Commerce; Chas. A. Dostal, Pacific Coast Mgr., Westinghouse; Wm. A. Day, Pres. Federal Reserve Bank of S. F.; Mr. Cabot; F. M. Smith, Regional Conservation Director, WPB; Thos. Brooks, Chief Administrative Officer, City of San Francisco; Fred Parr, general chairman, Salvage for Victory Committee; Russell Smith, V. P., Bank of America; Raymond Alvord, Pacific Coast V. P., Genl. Electric.



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--you need still more to keep trained employes on productive jobs, leaving load-handling drudgery to capable Elwell-Parker Trucks

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ELWELL-PARKER *Power Industrial* TRUCKS

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Spotlight on the NEWS

bombers, the contemplated plant will build wings and tail sets and blimps for patrolling Pacific waters. Last fall 2,800 employees were on the payroll, but by January 1 an expansion to 9,000 workers was expected.

High Octane Plant

A \$12,000,000 plant for manufacturing 100-octane gasoline for the nation's fighting planes will be constructed by the Reconstruction Finance Corporation adjacent to the Utah Oil Refining Company's plant in North Salt Lake. Condemnation proceedings on 14 acres of land were instituted to give the government an outright title, instead of the leasehold usually sought for property that will only be used during the emergency. The plant will be operated by the Utah Oil Refining Company, it is understood.

Coast Record Stands

West Coast shipyards are continuing to build Liberty ships faster than elsewhere. National average in November was 56 days from keel-laying to delivery. The coast record was: Oregon Shipbuilding Corporation, Portland, 13 ships, average 37.5 days; Richmond Shipyard No. 2, 10 ships, average 43.8 days; Richmond Shipyard No. 1, 8 ships, average 49.9 days; California Shipbuilding Corporation, Wilmington, 13 ships, average 50.8 days; W. A. Bechtel Company, Sausalito (just getting into production), one ship, average 149.01 days.

More War Contracts

Further efforts are to be made in 1943 to channel all available Pacific Coast manufacturing facilities into the war production program. The Army has been directed to work with WPB offices in spreading war work into remaining western plants now working only part-time or entirely without war contracts.

All but a small percentage of West Coast plants have been placed in war work. Many woodworking, sheet-metal and other firms are also active in producing materials and equipment for the shipbuilding and aircraft critical housing areas. When this work is

completed, however, these firms will have to get into war work.

The Army and the WPB have already placed a large volume of small business contracts on the West Coast ranging from more than \$20,000,000 in wooden truck bodies, to major sub-contracts in ammunition boxes, invasion barges, shipbuilding and aircraft industry parts.

The 1943 objective, through combining the forces of the Army and WPB procurement and production staffs, is to search out those plants with "distressed" operation schedules which can be moved swiftly into sub-contracting of Army production for the second year of war, the War Production Board executive said.

These plants will be checked against prime contracts now under way or planned for 1943, and Army contracting officers will then take direct action in revising present or future contracts to accommodate these newly available facilities.

Another Long Beach Yard

The Long Beach area's seventh major shipyard, Standard Shipbuilding Corporation, has begun building eight 157-foot tugs on a \$3,500,000 Maritime Commission contract, to be completed within a year.

A permanent shipbuilding and repair yard has been laid out with four ways for vessels up to 200 feet long. Other facilities will include a 150x60-foot combination

warehouse and mold loft, a machine shop, woodworking shop and offices.

The company plans prefabrication of units and line-production of ship parts.

Mineral Development

Potash Company of America has entered into an agreement with the Utah Magnesium Corporation for development of 3000 acres of land controlled by the latter along the Denver and Rio Grande Railway's main line near Thompson, Utah.

Potash Company operates mines and refineries at Carlsbad, N. M.

Kaiser Goes Into Rubber

An application for the construction of butadiene and styrene plants in southern California is understood to have been filed with William M. Jeffers, rubber director, Washington, D.C., by Henry J. Kaiser.

His plan is to use benzol from the coke ovens of the Kaiser steel plant near Fontana. The necessary alcohol could be produced at the local wineries and by the Monarch Brewing Co. of Los Angeles. It is claimed that there will be sufficient benzol and alcohol available to produce 10,300,000 lbs. of styrene and 34,400,000 lbs. of butadiene per year, which would yield approximately 20,000 tons of buna-S rubber.

• Six employees of the First National Bank, Portland, who work an extra shift at night at Gunderson Bros., building plywood lifeboats, are demonstrating equipment here to the bank president, E. B. MacNaughton (extreme right), who holds the flare gun used for signaling. From left the others are: Nick Rossi, Aaron Knutson, Wes Stewart, Jr., Ralph Williams, Larry Clark, Ward Roberts.



—Photo courtesy Portland Oregonian



• Suitable working styles, with Liberty ship section as background. Story on opposite page.

WOMEN—First Step is Training

***Vocational School Found Effective in Preparing Workers for Seattle
Textile Manufacturing Establishments Engaged in Filling War Contracts***

AS AN outgrowth of the Seattle textile industry's labor-stabilization agreement—and what has become an important and integral part of the setup since the agreement became effective on Oct. 1—is a free vocational training course established at a public school training center.

This training program for women, who are to become power machine operators in plants engaged in the making of clothing on war contracts, is notably successful, according to its sponsors.

Day and night classes at Edison Vocational School for this training-for-industry course are completely filled to capacity with more than 100 women on a waiting list. Already as many have been graduated.

Prior to establishment of the new program the school had been unable to enlist enough trainees to keep its power machines

To meet the need for information about the myriad new problems arising from the constantly increasing employment of women, Western Industry will publish a series of articles from now on, dealing with various important questions that affect efficiency. Training of women supervisors will be the topic of the February article.

busy. It offered its complete cooperation and facilities for the new plan if the Seattle Chamber of Commerce, together with the Seattle Quartermaster Depot, would sponsor the program and assure sufficient women students. Through an educational campaign Seattle women were appealed to and offered the vocational course of training for jobs in the war clothing industry free of charge.

Women are trained to make actual gar-

ments and are placed at jobs in plants, upon completion of their training, with the understanding that they will work exclusively on war items. It was the patriotic appeal to the women, many of them not seeking employment, that brought the enthusiastic response. The majority of the trainees are older women who would not be able to stand the rigors of shipyard work. They are, however, turning out excellent work in the textile industry, according to reports.

Before starting the course women are required to sign an agreement to take the free course with the understanding that they will be employed in a Seattle plant engaged in the production of clothing items for the Army Quartermaster Corps. "In view of this," the agreement states, "I agree that upon accepting employment

with the particular plant to which I am assigned by the Seattle Chamber of Commerce, acting as clearing house, I shall remain there for the duration of the war contract which is being fulfilled by that plant."

Major Martin A. Hammer, procurement planning and labor liaison officer for the quartermaster corps in the Seattle area, sanctioned the agreement as well as the labor-stabilization agreement and assisted with the organization of the entire program.

Fashion Show of Work Togs

A fashion show of working wear carried by Portland stores, to show that women workers need no longer forage through the men's departments for their togs, was held by Oregon Shipbuilding Corporation in November. Six Oregon State College girls modeling the garments are shown on the opposite page and the outfits are described below. Left to right they are:

1) Miss Helen Gibler, electrician's helper, slack and shirt ensemble. The twill shirt is washable, and comes in brilliant red, army tan or navy blue. The slacks are of the washable army drill type in militia blue or army tan. Recommended for those women working in warehouses, electrical shops, or employed as messengers.

2) Appearing in all-wool gray flannel slacks and a shirt made of bandana kerchiefs, was Miss Janet Johnson, material ways force. Over this outfit she wore an all-wool waterproofed double-breasted navy pea jacket.

3) Worn by Miss Izora Jarvis, electrician's helper, was a Sanforized-shrunk defense overall of heavy copper-colored denim. Beneath the matching jacket was shown a pre-shrunk gingham shirt, which comes in cheerful plaids.

4) The "Function-all" garment in denim was modeled by Miss Shirley Fisher, electrician's helper. This particular one-piece coverall was made by a sportswear manufacturing firm in Portland. The "Function-all" features a smartly full belt and patented drop seat.

5) Miss Ruth Cummins, warehouse worker, modeled the same overall outfit as worn by Miss Jarvis, but in a shade of blue. In addition, she wore a waterproofed poplin ski cap, cherished for its convertible ear-warmers.

6) Wearing a one-piece belted coverall fashion was Miss Roberta Sparks, welder. This is another style developed by O.S.C. women workers, and is 65 per cent wool, 35 per cent cotton gabardine to be warm and water-repellent. It features a zippered coin pocket, an unusually long shirt tail for extra warmth, and an ankle strap for safety.

Planning Now For Post War

A COMMITTEE on Post-War Economics of the California State Chamber of Commerce has been set up to furnish machinery for exchange of necessary information and integration of individual plans into industry and regional programs, and to make a concerted effort to mould governmental policies along lines which will assist and not hamper private enterprise in reaching the desired goal of sustained maximum production and employment.

Asa V. Call of Los Angeles is chairman. Basic problems which will be taken up include:

(1) A study of the degree of rapidity with which men in the armed services should be demobilized and returned to their former occupations.

(2) Study of policies which should be pursued by government with regard to unfinished contracts for war material production at the end of the war.

(3) Extent to which such controls as price controls, priorities and rationing should be continued, or removed.

(4) Extent to which employment in the vastly expanded aircraft, shipbuilding, and related subcontracting industries, will shrink after the war.

(5) How provisions can be made for dealing with unemployment, relocation and reconversion problems which will be particularly acute in this state immediately after the war; extent to which new industries or industrial expansions will be made possible in the state.

Post-war planning will be important features of the two meetings at Los Angeles Feb. 17 and at San Francisco Feb. 24, which will substitute for the annual iron and steel group meeting at Del Monte, the hotel having been taken over by the Navy as a training school.

Nursery Schools Face Crisis

WPA nursery schools which make it possible for many mothers of young children to take war industry jobs, will largely close down on February 1 when the WPA is liquidated, unless school authorities take quick action to obtain federal funds from the national Lanham Act.

California has 111 of these schools, but the only city that has yet received Lanham funds is Vallejo, where Miss Roberta Winans has been appointed director of a child care program. Dr. Lois Meek Stolz, child coordinator, State Council of Defense, is urging boards of education to make immediate applications for funds for an extended program of new nursery schools and projects for before and after school care for school age children.

NECESSITY OF MAINTAINING HIGHWAY SYSTEMS

(As reported to the California State Chamber of Commerce War-Time Conference at Los Angeles, December 2, by Charles H. Purcell, State Highway Engineer)

CALIFORNIA'S more sparsely populated area and lesser road density than eastern states necessitates much of the highway traffic traveling greater distances to and from destinations.

	Population per sq. mile	Road mileage per sq. mile of area
California	44	0.6
Illinois	141	1.9
New York	281	1.9
Ohio	168	2.0
Pennsylvania ..	220	2.0
Massachusetts ..	546	2.1

Concentration in three separate areas, far from the interior portions of the state and far from each other, makes them largely dependent upon truck transportation not only for food products but industrially for raw materials processed or fabricated in these metropolitan areas.

Total population	7,000,000
Concentration in San Francisco, Los Angeles and San Diego metropolitan areas	4,100,000 (60%)

Trucks carry major portions of the freight. California Railroad Commission breaks down the intrastate freight movement (freight whose origin and destination both lie in California

and is transported by public carriers for tariff) as follows:

Total intrastate freight for 1941.....	\$157,000,000
Hauled by truck.....	105,000,000 (66.8%)
Steam railroads	43,200,000 (27.5%)
Express carriers.....	4,740,000 (3.0%)
Electric railroads	1.4%
Water carrier	1.4%

Above figures do not include freight transported in trucks owned by the producer or manufacturer, e.g., agricultural produce, livestock, lumber and mineral products.

Examples of truck movement:

All petroleum moving less than 200 miles (by a recent ODT order) totals.....	5 billion pounds
Market milk, annual total	2 1/4 million tons
Aggregate and other misc. stone.....	23 million tons
Vehicle miles of truck travel on rural highway system.....	1.7 million miles
Increase of truck traffic in last two years.....	65%
Increase in bus traffic, same period.....	300%

Kaiser shipyards, San Francisco bay area, receive 50 per cent of their freight by truck, 85 per cent of employees travel to and from work by automobile. Emeryville industrial district, 50 per cent and 90 per cent; Pacific Gas & Electric Co., 40 per cent and 99 per cent.



• Long shadows (left), are a treacherous problem, because early morning or late afternoon shadows may reveal a target to the reconnaissance photographer unless the camoufleur breaks them up (right) with plywood shapes. Even the smokestacks are almost invisible.

CAMOUFLAGE—Western Plants Well Hidden

DURING the 12 months since Pearl Harbor, a small handful of artists and engineers have been spending their days and most of their nights devising effective means of concealing West Coast defense plants from the eyes of the enemy.

As a member of this group, I have seen professional interest in camouflage grow from the stage of scattered individual effort by a single designer here and there, to a group effort; thence, to a series of organized camouflaging units.

Contrary to prevalent opinion, it is not necessarily the camoufleur's function to hide or eliminate the factory from enemy eyes. One of his most important jobs is to confuse. It would be possible, with sufficient money and time, to hide completely many a plant, but most authorities, in computing the speed of an approaching bomber and the limited time which the bombardier has to find his target, agree that so-called total camouflage is not essential in many instances.

Because camouflage is a three dimensional problem, it is almost universally studied by the means of a miniature. This necessity is dictated by the fact that sunlight and shadow are ever changing and a two-dimensional scheme does not solve this telltale factor.

Today when a camoufleur is commissioned to design a "cam job," he immediately confers with local civilian defense authorities, plant owners, adjacent property

By HARPER GOFF

Artist, motion picture set designer and illustrator, Mr. Goff has designed and supervised the camouflaging of many factories, including one of the great aircraft plants. Within 72 hours after Pearl Harbor he, Lieut. Robert Gillespie, U. S. Engineer Corps, Bert Teitlebaum, head of Warner Bros. art department, and Arthur Kookan, Warner's chief draftsman, organized the Warner Bros. Camouflage Unit.

owners and the Army command. From air photos and sketches he painstakingly builds a scale model of the area, working out his problems thereon.

These models are sufficiently accurate that their public display would be against the nation's best interests. However, I was recently commissioned to build a pair of hypothetical models, from which the photos appearing herewith were taken. These models were prepared for Premier Oil & Lead Works of California.

To camouflage only a factory would not be intelligent practice. If the enemy expects to find the target in a certain location, he will be suspicious if none is visible. He will study photographs more carefully and quickly find the exact location of the hidden plant.

To hide or obscure adjacent reference points even several miles away is as necessary as to do so to the target itself. If the enemy is to be kept from rapidly pene-

trating our mask, we must resort to area camouflage.

At least 35 per cent of the effectiveness of camouflage depends upon what is known as "camouflage discipline," or the willingness of everyone in the area under observation to abide by a set of rules. These may include such widely varied requests as the prohibition of smoking chimneys; the abandonment of certain roads; the constant maintenance of shine-reducing or glare-reducing properties on railroad tracks and high tension wires; the organization and distribution of traffic at certain hours; the parking of cars according to a preconceived plan; the frosting of certain windows to eliminate sunset and sunrise glare, and hundreds of other inconveniences that may be visited upon the people in the entire area surrounding the target.

In this model, a large portion of the factory—administration building and numerous plant buildings—were "broken up" by painted surfaces having the appearance of smaller buildings from bombing altitudes. The shape and height of smokestacks were minimized by irregular shaped light wood and cable fins attached about halfway up the stack—painted to blend into the surrounding design.

In dealing with our shadow problem, it can be seen that paint alone is not enough. Paint needs an ally—a three-dimensional structural sun-reflecting and shadow-casting ally. Light must be introduced into shadow areas and incidental

shadow areas introduced back into light areas.

Long, straight, persistent shadows cast by rows of buildings must be broken up by these structures. Their construction must be such that only its effect, or visual properties, are visible from the air. Methods of supporting and maintaining these shapes, nets or canopies must not be seen. No matter how clever and how real a forest may look, a photographic interpreter is on the lookout for telltale signs that will reveal man-made construction.

The type of construction, of course, must be cheap, fire-proof, water-proof, and wind-proof. It must be light weight and have a certain amount of elasticity. Hard-boiled construction looks static and stiff from the air. Pliant circus tent construction, moving a little in the breeze, is more desirable.

No single mechanical consideration is more important to the camoufleur than paint. For no matter how successful our camouflage hides the plant from the bombardier's eyes, one must remember that he is equipped with highly technical photographic apparatus which is designed to penetrate paint and net camouflage.

It does this by means of color filters and infra-red film, which betray man-made and man-painted imitation vegetation and other surfaces.

To overcome this weakness, alert paint manufacturers in America's paint industry have been on the job. Today, we have camouflage paints that react to all known photographic and sensitometer tests precisely as does natural foliage. This one advancement in technology has been an immeasurable aid to camoufleurs throughout the land.

These new infra-red reflecting properties have also increased the durability of paint as well as to reduce the inside temperature of the object painted as much as 15 degrees when compared with the same color in ordinary paint.

Unique Water System

• Because of the value of water to the community and the necessity of avoiding any waste of water for agricultural purposes, a complete recirculating system, with a reservoir covering 310 acres for collecting and storage purposes, has been completed for the huge Geneva plant in Utah of the United States Steel Corporation. There are two sources of water, the metropolitan water district in the Wasatch Mountains, from which pipelines have been constructed, and the other the artesian wells on the plant site property. The system will not only conserve water but also bring into the area for agricultural needs a larger quantity of water than was available before.

Western Contractors Prove Versatility

VERSATILITY of Pacific Coast contractors in handling all sorts of operations is well exemplified in the achievements of Barrett and Hilp of San Francisco.

Although housing projects are one of their chief activities at the present time, they have also built a shipyard, are starting 26 concrete ship-barges and have completed more than 150 projects of various kinds at Mare Island Navy Yard, receiving the Army-Navy Construction Award for their speed, efficiency and cooperation in handling the latter.

Two new housing contracts, to be built under urgent high speed, have just been begun. The first is 1,000 war apartments at Vallejo for war workers of Vallejo and the Mare Island Navy Yard. It will run approximately \$1,800,000. Second is a \$500,000 500-man dormitory at Hunters Point, San Francisco, for dry dock workers. Both are Federal Public Housing Administration projects in conjunction with the Vallejo and San Francisco housing administrations.

The first of three housing projects for the Moore Dry Dock workers has been completed and the second is already under way.

Eastern contractors got a first-hand glimpse of the speed of Western contracting firms when Barrett and Hilp did the largest housing job in history, 5,000 prefabricated houses at Portsmouth, Virginia, for Norfolk Navy Yard workers in 180

days. This was at the rate of 67 houses a day.

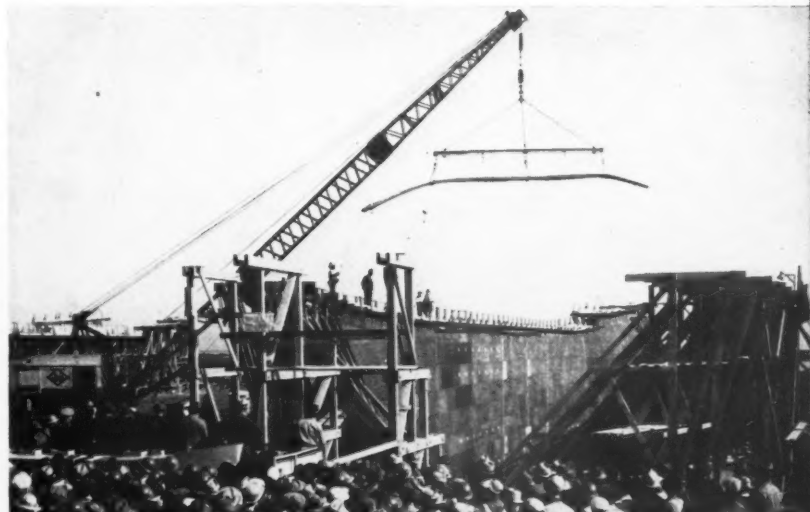
At the Belair Shipyard they not only built the yard itself, but are also constructing the concrete ship-barges that are to be launched there. Great improvement in the type of aggregate has been made since the last war, so that the grind is much finer and the concrete vessels to be used this time have a thinner shell that at the same time is more watertight.

Barrett and Hilp and their sub-contractors and all employees on the Mare Island Navy Yard and Belair Shipyard activities had a gala week-end Dec. 5-7. On the first day the "E" flag for the Army-Navy award and the "E" pins to the employees were presented at Mare Island, and in the evening Mr. Barrett and Mr. Hilp entertained 2,000 employees in Scottish Rite auditorium in San Francisco at an "Achievement Celebration."

Pearl Harbor Day, the following Monday, was celebrated with a special program at Belair Shipyard, when the first steel rods were lowered into the hull of Ship No. 1 and a bond-buying campaign was started.

The management announced at this time that they would match employees' purchases of war bonds, dollar for dollar. Major General Paul B. Malone, retired, was the orator of the day, and the picture shown below was taken on this occasion. Rear Admiral W. L. Friedell, commandant of the Navy yard, presented the "E" flag on Dec. 5, and Col. Stuart M. Hall bestowed "E" pins on the workers.

• In building concrete ship-barges, aggregate is poured into form which are slid back when the hull is to be finished off. Launching is accomplished by letting water flow into the submerged basin.



WESTERNERS AT WORK...

Lumber Specialist

Professor J. Kenneth Pearce has been given a leave of absence from the University of Washington to take charge of lumber production problems for the War Production Board in the western states. He will handle the problems of logging, logging transportation, sawmills, tie mills,



J. KENNETH PEARCE
Tackling Lumber Problems

shingle, planing and lumber mills and creosoting plants. Professor Pearce has a problem on his hands because lumber, a critical material, with this year's production estimated at 32 billion feet, will fall six billion feet short of requirements.

Stout Comes West

William B. Stout, former associate of Henry Ford, who was responsible for the first all-metal commercial airplane and has done outstanding development work in improving the design and performance of planes, automobiles and other transportation facilities, has been engaged to work full time for the Consolidated Aircraft Co. He is to spend most of his time in San Diego working with Harry Woodhead and T. M. Laddon, president and executive vice president, respectively, of Consolidated.

Succeeds Jackling

David D. Moffat, Salt Lake City, has been made president of the Utah Copper Co. of which he has been vice president and general manager, succeeding D. C. Jackling of San Francisco, who has retired. His first connection with the company was in 1910. From 1914 to 1919 he was superintendent of the Ray Consolidated Copper Co., Arizona. For the next five years, he was consulting engineer of mills for the D. C. Jackling interests. In

1924 he became assistant to the general manager of Utah Copper, and in 1930 he was elected vice president and general manager. Also, a few months ago he was elected vice president of the Kennecott Copper Corp.

Heads Lead Company

James L. Caruth is the new manager of Pacific Coast operations for the National Lead Company, with headquarters in San Francisco. He has been with the company for 19 years, and until March, when he became assistant manager on the coast, was manager of the Cleveland branch. Mr. Caruth succeeds R. P. Prentys, who retires after 33 years of service. Dave Schindler,



JAMES L. CARUTH
National Lead's Coast Manager

coast sales manager, takes over the advertising and sales promotion duties of L. G. Harrier, who has joined the Navy.

Manpower Job

General H. G. Winsor has retired as personnel officer of the Puget Sound Power & Light Co. to give full time to constantly increasing responsibilities as director of the War Manpower Commission for Washington and Oregon. He started with the commission in 1941, and was named regional director, July, 1942. General Winsor has been active in the electric industry for 57 years.

Chamber Trustee

George Dunn, Jr., president, Webster-Brinkley Co., Seattle marine machinery manufacturing firm, has been appointed a trustee of the Seattle Chamber of Commerce. He succeeds William O. McKay who resigned to enter active duty with the United States Marine Corps.

Manages B. M. I.

Anaconda Copper Company, which recently acquired controlling interest in Basic Magnesium, Inc., have loaned F. O. Case to B.M.I. for the duration. Mr. Case has been with Anaconda since December, 1920, helping to design zinc oxide plants for East Chicago, Indiana and Akron, Ohio, building these plants and establishing operating and sales organizations. In 1936, he took over the management of lead refining operations at East Chicago, and of phosphate operations at Conda, Idaho and Anaconda, Montana.

Awarded Medal

Ernest O. Lawrence, director of the Radiation Laboratory, University of California, Berkeley, has been awarded the Holly medal of the American Society of Mechanical Engineers at the annual meeting of the society in New York held last month. The award was for his work in originating the cyclotron.

Kindelberger Busier

J. H. "Dutch" Kindelberger is a member of the Regional Management-Labor Policy Committee of the War Manpower Commission which met recently in San Francisco. This work in addition to his duties as president and managing director



J. H. KINDELBERGER
Manpower and Planes

of North American Aviation, Inc., Inglewood, Calif. Mr. Kindelberger came to Los Angeles in 1925 to work as chief engineer for Douglas Aircraft Company, and in 1934 he became a vice president. In July, 1934, he was named president of General Aviation Mfg. Corp. in Baltimore, Md., a subsidiary of North American Aviation, Inc.; and on January 1, 1935, he was appointed to his present position.

Industry Trains New Employees With Films

WARTIME conditions have dumped many problems in the lap of industrial management and not the least of these is the perplexing one of how to train large numbers of new workers in unfamiliar skills. Probably few industries in the West have a more serious employee training problem than the shipbuilders, for West Coast shipyards have absorbed many thousands of untrained workers, men and women alike, in an almost unbelievably short period of time.

Management has long wrestled with the problem of personnel training and most progressive industrial concerns maintain departments charged with the responsibility of seeing that employees know how to do their job. The rapid shifting of large masses of manpower due to the pressure of war production, however, has magnified the importance of employee training to unprecedented proportions.

The shipyards have not only had to train many thousands of unskilled workers in specialized crafts but they have had to accomplish this tremendous training job in a minimum of time. Their personnel training departments have therefore sought training methods that would provide instruction quickly and effectively to large groups.

One of the training tools now in regular use by the shipbuilding industry is the slidefilm. The shipyards have found that these training films shorten the learning period for the worker and introduce him to the use of new tools and new techniques in an orderly step-by-step method.

While slidefilms are not new to industry generally, their application to shipbuilding is relatively new. Being completed at the present time by a San Francisco producer is a series of reading slidefilms covering every phase of shipfitting practice. The series includes from 80 to 90 subjects ranging from demonstrations of simple tools to the more complex procedures of installing pre-fabricated units in the ship's hull.

The films are used as features of regular classroom instruction. The instructor is able to portray actual working conditions without the necessity of taking the class to the ship ways for the films bring the shipyard into the classroom through the medium of expertly posed pictures.

The reading slidefilm is ideally adapted to teaching specialized techniques since the instructor can control the pace of the film. Individual frames can be "frozen" on the screen for as long as the instructor wishes to discuss the point that is being demonstrated.

Sound slidefilms, according to the producer of the shipyard training films, are also widely used as training aids by manufacturers to educate dealers or jobbers and their sales and service staffs in the proper use of equipment and materials. The sound slidefilm is a filmstrip like the reading slidefilm but with audible text on an electrical transcription instead of the reading captions.

• Reproduced at the right is a typical film from the series on shipfitting now being used on the Pacific Coast. Older hands who need training in approved technique also are shown these films.

MARGIN BRACKETS

A PHOTO & SOUND PRODUCTION

TYPICAL AMIDSHIP MARGIN BRACKET

TYPICAL AFT SECTION MARGIN BRACKET

Margin brackets vary in shape, but they all serve the same purpose

Margin brackets are welded to the tank top to hold the frames of the side shell in place

Since the margin brackets are to hold frames, they are always set to the frame lines of the tank top

They are placed directly above the floor of the double bottom

To set margin brackets...

First locate frame lines on tank top with reverse marker

On each frame line, measure in from edge of tank top. Mark where inboard end of bracket is to be

The brackets next to the frame line are then placed, and so on. The same method is used with all margin brackets

THE End

PRODUCED BY

Forward of amidships the brackets are forward of the frame line. Aft of amidships the bracket is usually aft of the frame line

Forward of amidships the brackets are forward of the frame line. Aft of amidships the bracket is usually aft of the frame line

Forward of amidships the brackets are forward of the frame line. Aft of amidships the bracket is usually aft of the frame line

The bracket is set perpendicular to the tank top. Check it with a two-foot square

Tack the bracket at both inboard and outboard corners

A temporary reinforcing bar is placed at an angle between tank top and floor

THE End

PRODUCED BY

Seattle Prefabricator Uses Line Principle

PREFABRICATING houses on the production line principle, to the extent of assembling the entire houses in the factory and then transporting to the building site, has helped to speed up relief for Bremerton's acute housing shortage.

As long as two years ago the problem of taking care of workers flocking to this Puget Sound naval base became serious, and the overflow was absorbed by Seattle and Tacoma. Navy yard workers have been commuting ever since, meanwhile hoping that home construction in Bremerton would eventually make it possible to live closer to their jobs.

One thousand prefabricated homes are to be completely erected within 80 days at Anderson Cove, Sinclair Heights and Westpark. They are being made up at the Prefabricated Products Company plant in Seattle.

Cut to exact measurement specifications from endless lengths of room-size Douglas fir plywood Speedwall board, room partitions, ceilings and roofs, in fact, all necessary prefabricated component parts for a house, are loaded on a truck—one house to a truck—and each day 18 such houses are transported from Seattle to Bremerton via ferry. A series of "ground crews" erect

them immediately. Each home is finished in approximately 39 man-hours.

For the thousand houses, 1,800,000 feet of room-size Speedwall board was cut in lengths as long as 20 feet and as short as $1\frac{3}{8}$ inches. This board was used for all interiors of outside walls and for all inside wall partitions, resulting in a saving of material which would ordinarily be cut out for doors and windows. Use of the Speedwall board eliminated the making of joints between plywood panels by the prefabricator either at the factory or building site, it was pointed out.

Interior wall partitions are glued to studding, not hung on nailed members, resulting in a much stronger wall due to the even distribution of weight along studding, according to the manufacturer. Glue is applied to the studding by "guns" and one side of the partition is laid down. The wall is then reversed and the procedure is repeated on the other side.

Many pounds of metal in nails are saved in the prefabrication process as wall and ceiling panels are tacked at corners to hold them in place while the glue sets. But one ceiling panel is used, it being glued to joists with insulation added.

Most of these new Bremerton houses

are duplex, comprising two individual houses erected end to end for space saving. The units are demountable and can be removed and re-erected as individual houses after the "emergency."

A variety of six floor plans with different exterior and interior decorations and trim were specified by Naramore & Brady, Seattle architects. The houses are based on wooden framework anchored to concrete piers. Unlike most construction, hardwood floors were laid first, the houses erected afterwards.

Fred Dally, manager of the Prefabricated Products Company, is the general contractor and prefabricator of the new housing project. Dally's prefabricated plywood houses, hospitals and administration buildings were erected along the clipper route to China in 1936—on Midway, Wake and Guam.

1,200,000 Pounds Of Guayule Rubber

Output of the guayule rubber factory at Salinas, California, this season should be about 1,200,000 pounds of rubber, *Western Industry* is advised by Evan W. Kelly, director of the Guayule Rubber Emergency Project. His estimate is based on laboratory tests made of the only shrub that will be available this year for processing, acquired from the Intercontinental Rubber Company.

The Salinas factory is being overhauled as fast as material priorities will permit and at the time of going to press was expected to be in operation before long. The factory is capable of processing about 25 tons of shrub a day, and thus producing 10,000 pounds of rubber where the percentage of rubber is about 20 per cent.

Upwards of 350,000,000 seedlings are being dug from the nurseries in the Salinas Valley and transplanted in 32,000 acres of land under lease. The nurseries at Indio and Oceanside were started a little too late to get a full crop this year. Another site has been chosen near Bakersfield. Plantings in Arizona, New Mexico, and Texas this season are confined to experimental plots.



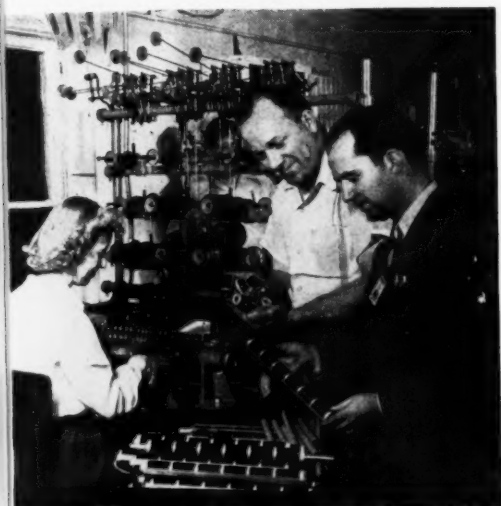
• This plant is laid out to prefabricate entire homes simultaneously. Jig tables, parallel to each other, extend the length of the plant, spaced far enough apart to permit passage of materials. One production line takes care of wall partitions, another one handles floors, and so on.



• Putting a shine on a nose instead of taking one off is a little unusual for a woman, but that's the job these gals are doing to the noses which are being prepared for installation on Douglas Aircraft Co.'s "Havocs"—Army attack bombers.



• Western Pipe and Steel men 12 hours making ready; and then mit weld gets done in only 30



• N. R. Smith, Lights, Inc., is explaining operation of a loom which spins ignition coils and electric relays, turning hair-fine wire into coil assemblies.

WESTERN INDUSTRY In Pictures

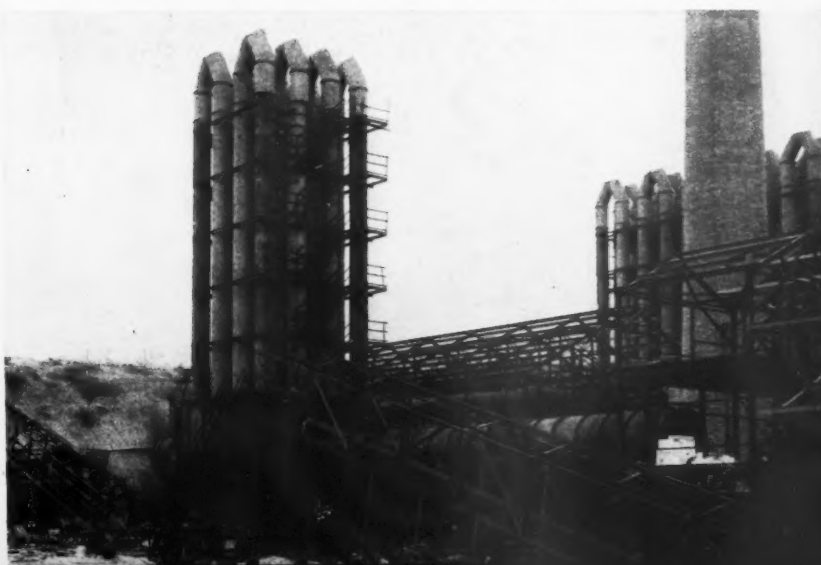


• Utility freight car loader saves space, eliminates damage. Cross member is wedged against shipment to lock load, assuring safety in transit.

• S. P.'s shops are teaching sailors how to tune 1,000 hp. Diesel switcher motors. D. L. Varrelman instructing.



• Bunker Hill and Sullivan Mining and Concentrating Co. are constructing this fuming plant at Kellogg, Idaho, at an approximate cost of \$1,000,000. Plant expected to produce a capacity of 35 to 50 tons of zinc a day from blast furnace



Military Gears Must Mesh With Civilian

Western Congressmen Feel Two Divisions of War Effort Must Be More Closely Coordinated

YOU may not altogether sense it at a distance but you may take it from those who are here that the 78th Congress is sour. Survivors from former sessions resent the pushing around they have had at the hands of the bureaucrats, and, in a lesser degree, from the people back home.



New members have joined the veterans imbued with the feeling of the people back home who elected them because they were angry about the way things were going on here. You may not immediately hear the dissonance in what they say or do, because it always takes a new Congress with many new members several months to find itself. And it is quite probable in the beginning they may be awkward, and do things that seem blundering.

The almost universal thought of the representatives from the West Slope—and, for that matter, from almost all other sections—was reflected in a remarkable speech made by Senator Downey (California) during the last days of 1942.

He told the Senate that California is now short 300,000 workers badly needed in essential non-war industries; and in addition 200,000 permanent workers on the farms, and 160,000 migratory farm workers. Moreover, he pointed out, the Selective Service agency expects California to supply 300,000 men for military service by the end of 1943; the aircraft industry in California requires another 200,000 workers; the shipbuilding and similar war industries demand another 150,000; and the various Government agencies expect for non-military services 100,000 workers.

This makes a grand total of 1,410,000 persons to be produced for service by California.

"Beyond any doubt and beyond any challenge, in California and in Arizona, certainly, and I believe in all other Western states," said Senator Downey, "we are rapidly moving into a condition of such extreme gravity, of such extreme danger, that unless the most active and energetic steps are taken we may expect the most serious consequences not only to the farmers but likewise to the civilian population and to the military program.

By ARNOLD KRUCKMAN

"Our telephone and telegraph companies, railroads, utilities, hospitals, garages, hotels, restaurants, laundries, farms, businesses, cannot be destroyed by the military effort without an entire breakdown of civilian activity.

"I found not a man in the aircraft business who had any idea where the needed workers are coming from except that it was anticipated women workers canning and packing fruits and vegetables may be lured from farm work. Let me add the inefficiency of workers in aircraft industry grows so great because of labor turnover and inexperience that the aircraft industry in California, at least, is certain to substantially fall off.

"I know we in California, and I think our citizens elsewhere, are headed for a great calamity if the military and the WPB continue to carry out the program they now have for 1943. I know the program cannot be done so far as it concerns California. I do not believe it can be done nationally. Already the aircraft industry is beginning to break, and we can see it. Already we

They Got Action

Scrap dealers of the Pacific Slope are responsible for a ruling by the War Manpower Board which places the skilled workers of the industry in the classification of essentiality, giving them exemption from the draft. The question was brought up by David B. Rosenthal of the Eastern Iron and Metal Co. of Los Angeles.

Mr. Rosenthal found that a number of his most needed men were in immediate prospect of induction. He got in touch with your correspondent here who took up the problem with Mr. McNutt's office and with the office of General Hershey. Both immediately placed the situation before the joint committee, which included representatives of the Army and Navy.

Almost immediately the War Manpower Board people on the West Coast were advised of the situation. The potential inductees were reclassified temporarily.

Meanwhile the agencies in Washington were so thoroughly convinced of the essentiality of scrap workers in the jobs where they were employed that the announcement of this opinion was included in a regular bulletin, thereby formally establishing the essentiality of the industry and its workers. The ruling now applies to employees of all metal scrap dealers in the United States.

One of the best-informed writers at the Nation's Capital, Arnold Kruckman, presents each month authoritative comments on political developments and their practical application to industry of the West. Any reader who wishes additional information may write to him directly, using business letterhead, at 1120 Vermont Avenue, N.W., Washington, D.C. Inquiries will be answered free of charge. You also are invited to contact him personally in Washington. Copies of pending congressional bills may also be obtained free of charge.

are beginning to go backward because we are trying to go too fast.

"Why break down our civilian economy to build an army of seven or eight or nine million when we cannot get it outside of the United States? As a matter of fact, within the next two years—and I challenge any military authority to deny these figures—we cannot move outside the U. S., because of lack of shipping, more than four million men.

"I hope and pray we may get our Army down to some size, say, 5,000,000 men. If we do not do that, I here and now unequivocally testify and prophesy—and I hope someone will remind me in 90 days if it does not happen—that we are going into the most chaotic conditions in California and in the United States."

It is generally assumed here among the Western delegation that the West Slope is expected to supply a gross total of 5,000,000 workers and military men during 1943.

There are definite indications that McNutt will attempt to reduce the manpower program of the Army. He has already locked horns with the military services. McNutt's powers are very wide. He has complete authority to place limits on military manpower demands.

The new manpower order prohibits enlistments. But its most specific machinery is the so-called Baltimore Plan, which prohibits the hiring of any person without written release from the current employer, compels the use of local labor and forbids discrimination against any race or sex or color.

No workers may be recruited outside of the community. All employers must agree that skilled workers shall be transferred from non-essential to essential industries, with full seniority rights intact, upon demand by those who need the workers.

The plan is in operation in Detroit, Philadelphia and Connecticut, and is expected to be in full operation shortly in some communities of the Pacific Northwest.

SPEEDS WAR PRODUCTION EVERYWHERE



MACHINE PARTS ARE HARD TO GET



You can help make the machinery you now operate last much longer without trouble, delay and expense of repairs and replacements, by using Lubriplate lubricants.

Reports from industry everywhere are telling how Lubriplate lubricants are helping to prevent shut downs and repairs. Some of these stories are almost beyond belief.

Everyone engaged in war production owes it to his Government . . . owes it to himself . . . to see what Lubriplate lubricants will do to increase his production. Lubriplate is different. It is not to be compared with ordinary oils and greases. Lubriplate arrests progressive wear. It protects machine parts against rust and corrosion. It maintains a wear-resisting protective film on bearing surfaces. There are Lubriplate lubricants to meet all oper-

ating requirements, high and low temperatures, and in the presence of water and steam. Even under certain chemical conditions Lubriplate is performing in a manner that would be impossible with most conventional lubricants. Lubriplate outlasts ordinary lubricants many times, therefore it is extremely economical.

In these war days when production is vital and machine replacement parts are hard, or, impossible to get, Lubriplate lubricants will materially help keep machines running efficiently and at reduced power consumption. Write today for copy of "The Lubriplate Film" containing much valuable information.

ON GUARD



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LUBRIPLATE DIVISION

FISKE BROTHERS REFINING COMPANY

NEWARK, N. J.

SINCE 1870

TOLEDO, O.

WRITE FOR THE NAME OF THE DEALER NEAR YOU.

Heliarc Welding Makes Lighter Magnesium Possible

BASICALLY, this method of electric welding, useful with all standard direct-current welding machines, consists in striking an arc between the work and a tungsten electrode.

Simultaneously helium gas is fed to the weld area through an annular nozzle surrounding the electrode and the additional weld material needed for the joint is fed into the arc from an uncoated welding rod of substantially the same material as the work. Reversed polarity is used, i.e., the current flows from the work to the electrode.

The flow of helium, fed to the work area at .25 to .5 pounds per square inch, is controlled by a valve on the torch handle which is opened by the operator just before the arc is struck, and held open during the welding process. The arc is very quiet during a Heliarc weld—there is no tendency to spatter or throw materials from the weld as is sometimes the case with other processes; and a very uniform, high quality weld can be obtained by an average operator after short practice.

This method of welding will shortly be made available to the public under license, and while it was developed primarily for use on magnesium, it will probably find extensive use on alloy and stainless steels, where the results seem superior to those obtained by any other known method.

Quality of the weld is high, the strength of the joint varying from 80 to over 100 per cent of the parent material, depending on the alloy and welding conditions, and there seems to be no limitation in the type of joint that can be made—butt, lap, tee, corner, and angle joints being made with equal facility.

Use of any flux in the joint is completely eliminated by the helium blanket, and while minute quantities of tungsten are present in the joint, there are no adverse corrosive effects therefrom. Actually, the weld appears somewhat more corrosion-resistant than the parent metal, there being a slight electrolytic balance which causes corrosion, if it appears at all, to be present in the sheet adjacent to the weld rather than in the weld itself. This effect is so small, however, as to be negligible for all practical purposes.

Welds can be made with equal facility in rolled, cast, extruded, or forged parts, and some experiments have been made where cast and rolled or extruded parts have been welded to each other. Seams, fusion welded by the Heliarc process, are

"Heliarc" welding, which permits the arc welding of magnesium sheets, extrusions and tubing into structures simpler, lighter and stiffer than is possible in conventional duraluminum construction, was developed by two Northrop Aircraft men, V. H. Pavlecka, Chief of Research, and Russ Meredith, Welding Engineer. The description of the method presented here consists of excerpts from the study submitted by Mr. Pavlecka and John K. Northrop, president of Northrop Aircraft, Inc., in the James F. Lincoln Arc Welding Foundation contest and which won them a joint award of \$3,700. Northrop Aircraft, Inc., have designed heliarc welding torches which are being made available to the industry. Dow Chemical Co. have worked on the heliarc welding process in similar vein to Mr. Pavlecka, Mr. Meredith and Mr. Northrop, and the metallurgical aspects were presented to the American Welding Society by Thomas E. Piper of Dow Chemical.

distinguished by their metallurgical purity, homogeneity and absence of inclusions.

Dollar evaluation of the economic advantages of electric arc welding as applied to magnesium aircraft structures is a difficult task because of the many variables and intangibles involved. Direct comparison of the cost of a Heliarc welded seam and a riveted seam in the same materials is given hereunder:

COMPARISON OF JOINT COST PER FOOT IN .10 SHEET—APPROXIMATE EQUAL STRENGTH

Heliarc Welded		
Surface preparation	.250 hrs. at \$.97 per hr.....	.24
Setup	.083 hrs. at .97 per hr.....	.08
Weld time	.100 hrs. at 1.40 per hr.....	.14
Cleanup	.083 hrs. at .97 per hr.....	.08
Helium 1 cu. ft.		.02
Magnesium filler rod & tungsten electrode		.01
Electric current		.01

Total direct cost.....	\$.58
Overhead on labor at 100%.....	.56

Total cost per foot.....\$1.14

Riveted		
Layout and drill		
24 holes	.166 hrs. at \$.97 per hr.....	.16
Countersink 24 holes	.10 hrs. at .97 per hr.....	.10
Drive 24 rivets	.40 hrs. at .97 per hr.....	.39
24 rivets		.04

Total direct cost.....	\$.69
Overhead on labor at 100%.....	.65

Total cost per foot.....\$1.34

A contract for a number of airplane wings for Army Air Forces BC-1 trainer airplanes was given to this company early in 1941, and the design and development of these wings was begun at once, using Dow-metal J-1H alloy. The design criterion adopted was that superior and less costly

magnesium airplane structures could be designed and built for the same weight as the present more expensive aluminum alloy riveted structures.

The whole wing structure is composed of only two basic elements: the sheet, forming the monocoque shell; and extruded sections, forming the internal structure. The versatility of arc welded construction made it possible to limit the number of various extrusions, such as "tees," angles, etc., to no more than four different sections. Furthermore, the preparation of the profile sections and sheets was greatly simplified, because flanges for riveting, and elaborate templates for the shaping of parts and the coordination of multitudes of riveting holes, were no longer necessary.

Dimensional control of shrinkage distortion was solved by making proper allowances in lengths for shrinking, while shape distortion, manifested principally as buckling of the monocoque shell, was dealt with by applying heat and pressure through the use of ironing pads which relieved the internal strain in the sheet.

To make certain that no excessive locked-in strains are set up in Heliarc welded structures, experiments were carried out to obtain the absolute value of internal strains in magnesium alloys induced by welding.

At the worst, these stresses were found to be of the order of 1000 psi max., and are, therefore, of little consequence as far as the impairment of the integrity of Heliarc welded magnesium alloy structures is concerned. This is probably due to the relatively low modulus of elasticity and low yield strength of these alloys; both of these physical properties tend to adjust the metal structure readily to any internally imposed strains from welding.

The amount of welding is not indiscriminate; proportioning of the welded seams to the loads carried through them and selecting the type of weld to best fit the conditions of elastic flexure of the structure should be two recognized principles of electric arc welding application.

It has been noticed that on a number of electric arc welded steel structures these principles have not always been observed. The magnesium alloy Heliarc welded wings have been designed with great care in this respect.

Full length seams are used only where necessary. Otherwise, the seams are of the interrupted type, either on one side, or of staggered interrupted type on both sides of the edge of a plate or of an extrusion attaching joint. These practices were made

possible by the high metallurgical quality of the seams, their uniformity and relatively high strength.

For design purposes the Army Air Force allowed 75.9 per cent of the ultimate tensile strength of the metal to be used as the strength of the Heliarc welded seams in tension. This figure is based on tests of seams made in the early stages of this development, and much higher uniform values are now consistently being attained.

In the past, magnesium alloys have suffered from two generally known and popularly misunderstood faults. One is the general fear of their inflammability and the other is a deep-rooted, and by past performance somewhat justified, conviction that these alloys corrode rapidly.

As to the first, the experience of the authors is that the fire hazard has been greatly exaggerated; in spite of the intensive welding development of these alloys in the Northrop shops during the last two years, the only fires involving magnesium were those started deliberately for test purposes, or in experiments before helium was used.

It was discovered that the zinc chromate primer, generally used by the aircraft industry, acts as a potent fire inhibitor on magnesium, and that it is in fact impossible to ignite these alloys, even artificially, if they are protected by it.

Magnesium retains its elastic modulus to much higher temperature than is the case with aluminum alloys. This is an extremely desirable property, and in practice it means that a zinc chromate protected magnesium alloy structure will not collapse as readily as an aluminum alloy structure might do if exposed to fire.

Weather durability of magnesium aircraft structures in service is still undetermined. However, a wealth of artificial corrosion testing, and also gratifying results of the use of magnesium alloys on several truck bodies through a number of years, furnish convincing proof that corrosion is not as dangerous as is generally believed, provided proper surface protection is given.

This protection consists of treating the finished, welded and cleaned structures with sodium dichromate and painting them with standard zinc chromate primer and two coats of finishing lacquer. This protection has been found to be sufficiently elastic under load, as well as abrasion resistant.

One of the least desirable physical characteristics of the magnesium alloys is their inclination to strain corrosion. The elasticity of the surface finish helps here a great deal, but in addition the authors deliberately avoided stress concentrations in their design and saw to it that the maximum principal stresses anywhere in the wing remain low, viz., 12,600 psi max. in compression and 19,170 psi max. in tension.

Compared to the maximum allowable yield point in tension of 33,000 psi for J1-H alloy, this utilization of the material seems wasteful; however, it was done deliberately in order to favor the rigidity of the outer wing shell, and also to diminish tendencies to strain corrosion. It is apparent, however, that as service experience is acquired it may be possible to design these structures for less weight than the equivalent weight of aluminum alloy riveted structures, without abandoning the non-buckling principle.

Blindness No Handicap

• Eleven blind men and two blind women from the Hazel Hurst Foundation training school in Monrovia have been holding their own for a month against normal workers at the Lockheed aircraft plant and in some cases turn out more work than their fellows. Their dogs bring them to work each morning, finding their way through the maze of buildings and aisles and then sleep all day beneath work benches.



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CIO Pierces Kaiser Front

EARLY skirmishes in the fight of the CIO to break the solid AFL front in the Kaiser enterprises seem to have gone in favor of the CIO, but the real battle will begin when the National Labor Relations Board opens a hearing at Portland Jan. 11. In that proceeding the three Kaiser shipyards in the Portland-Vancouver area have been cited by the Board, at the instance of the CIO for alleged collusion with the AFL in recruiting labor.

The advantage won by the CIO was among the small group of technical workers in the Permanente magnesium plant, where 44 voted in favor of the CIO as their representative and nine for no union at all. The AFL had withdrawn from the election, on the ground that it would be inconsistent with their master contract covering all of the 2500 Permanente employees. CIO representatives assert that this contract was negotiated by collusion before the plant opened.

A deposition taken by the NLRB in advance of the Portland hearing from George Smith, former CIO organizer, said CIO workers could not get jobs unless they held AFL cards, and that a fee of \$1 a day had to be paid by new men for the first 90 days. AFL has charged two members of the NLRB with bias and prejudice and contended that the Smith deposition was out of order until the charge was settled.

The Kaiser case may not only decide whether Pacific Coast shipyards in general will be CIO or AFL, but also may set a rule for labor recruiting practices on big jobs, because President William Green of the AFL has threatened to go clear to Congress, if necessary, to sustain the AFL position.

NLRB cited the three Kaiser yards on the instance of the CIO Industrial Union of Marine and Shipbuilding Workers of America, who alleged that the yards had been helping 16 AFL unions recruit members. It was contended that the Kaiser yards signed an agreement with the AFL unions when there were only a handful of men on the job, and that a majority of the vast force now at work never had an opportunity to signify which union they preferred to act as their bargaining agent.

In William Green's statement of protest against the summons of the NLRB, the president of AFL virtually admits that the Army cantonments were built in the manner alleged by the CIO. "If such a contract is illegal or reprehensible," he said, "then every construction firm in the United States and the government itself stands indicted by the National Labor Relations Board. How were all our new Army camps, naval training stations and airfields built? Government agencies or private contractors working for the government signed agreements with AFL unions to supply the men to do the work. It was done efficiently and in record-breaking time."

The NLRB was sustained by the courts

when it found the Cornell Dubilier Manufacturing Company guilty of the same kind of discrimination in favor of the AFL and invalidated the closed shop.

Utah Ruling

• Attorney-General Grover A. Giles of Utah has advised the governor of the state that the eight-hour per day employment limitation is required by state law "except in cases of emergency where life or property is in imminent danger . . ." In such an emergency the working day may be extended beyond eight hours. As the Utah law forbidding the employment of women in mines and smelters does not mention mills or clerical positions in company offices, he advised that women could be employed in mills, particularly when the work is not dangerous to body or health.

Wage Increase

Six voluntary wage increase cases on the Pacific Coast have been acted on by the War Labor Board. Three increases were granted and three denied.

Patten-Blinn Lumber Company of Los Angeles were allowed to raise wages of 63 employees who had had no raises since January, 1941, under the 15 per cent formula to cover rise in cost of living.

To eliminate inequities and inequalities between previous wage scales of nine machinists employed by Rothe's Automotive Parts Company of Los Angeles and those paid in similar plants in the same area a wage increase was approved. Employees had been promised a raise in June by the company upon securing of war contracts. McClintock Display Company of Los Angeles were turned down, because since Jan-



• Absenteeism routed by Webster-Brinkley Co., Seattle, through "Time Clock" competition. "Attendance Aces" get war bonds and amount distributed fixed by number of attendance points earned by all employees.

uary 1, 1941, they had raised wages 26 per cent and salaries 16 per cent.

A plea of Markovitz & Fox Company of San Jose, repairers of burlap bags and scrap material to correct similar wage maladjustments for the company's iron yard workers was denied on the ground that wage increases of more than 15 per cent between January 1, 1941 and the issuance of the Wage Stabilization Order. However, 5 cents more an hour for women employees and warehousemen was approved to lift their wages to standard scales in the area.

California Electric Company and Interstate Telegraph Company was authorized to distribute \$40,000 to 615 employees under an agreed company net operating income program retroactive to July 1, 1942. Hamburger Apparel Company was denied permission to pay out Christmas bonuses 300 per cent in excess of those paid in 1941, but authorized to distribute bonuses on the 1941 scale to new employees doing "comparable" work.

NWLB can act on requests for pay increases only if they involve one of four issues: (1) maladjustment in comparison with wages paid for similar work in the same plant, industry or area; (2) where no wage increases have been granted since January 1, 1941; (3) to correct "gross inequities or inequalities;" (4) to assure "effective prosecution of the war effort."

Hot Cargo Suit

• First reaction from the "hot cargo" law approved by the voters of California at the November election is a \$2,026,544 suit against 19 transportation companies—railroads, draymen, motor freight and motor express by Montgomery, Ward & Co. The plaintiff alleges that their refusal to handle Montgomery Ward goods during the strike

of AFL warehousemen and clerks at the Oakland plant in 1941 constituted a sympathetic gesture to the strikers. A separate suit was filed in Portland for \$2,855,608 damages against railroads, truck lines and express companies for refusing to handle in their capacities as common carriers when the firm's Portland stores were closed by strike.

Here And There In Labor Picture

Thirty Pacific Coast industrial, labor and public leaders appointed to serve on War Labor Board panels to handle specific wage cases, appeals and disputes, to speed up action. . . . Richfield Oil Corporation and the CIO Oil Workers Union have agreed to submit to the War Labor Board for a decision, without a hearing, as to whether a federal order shall require Richfield's CIO workers to remain in the union for the duration of a new one-year contract. . . . Proposed strike vote by AFL Sailors Union of the Pacific withdrawn after War Shipping Administration rescinded orders to assign East Coast sailors to a Liberty ship being launched in Portland. . . . The NLRB overruled protest of Aircraft Parts Manufacturing Division of the Kroehler Manufacturing Corporation, Inglewood, Calif., that collective bargaining election

(Continued on next page)

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LABOR— (Cont'd from preceding page)

on representation by AFL machinists' local be postponed until expansion of the plant is completed, ordered election held by Jan. 10. . . . War Labor Board increased wages of 700 Caterpillar Tractor employees at San Leandro, Calif., 3 to 18 cents and approved standard voluntary maintenance of membership clause for AFL machinists' local. . . . Both AFL and CIO are campaigning among Douglas Aircraft employees, who have long resisted AFL and CIO efforts to organize them. . . . 25 cents increase a day ordered by WLB for common labor at the Bunker Hill and Sullivan Mining and Concentrating Company smelter at Kellogg, Idaho, in addition to the \$1 a day raise ordered for lead and zinc employees in Idaho. . . . CIO have opened a general organizing headquarters in the negro district in Los Angeles "to make the CIO an integral part of the negro community" and "to direct them to their proper places in the CIO set-up." . . . Negroes brought from New York to work in the Kaiser shipyard at Vancouver, Wash., have rejected the auxiliary union being formed for them by the Boilermakers Union, calling it "downright open discrimination." . . . North American Aviation is contesting the NLRB decision forbidding the company from receiving grievances individually instead of through the CIO United Auto Workers. . . . NLRB hearing began as to whether collective bargaining election at Century Metalcraft Corp., Los Angeles, shall be between the CIO and the independent Employees Welfare Association in the plant as a whole, as desired by the latter, or whether the election shall be in two groups, in accordance with CIO wishes. . . . 300 Santa Cruz Portland Ce-

ment employees voted to accept 5c an hour wage increases, subject to WLB approval, bringing minimum wages up to \$6.60 a day.

Aircraft Increase Is Recommended

War Labor Board will receive at its session in Washington January 8 the recommendation of Paul Porter, chairman of the wage stabilization conference, for an hourly increase of 5 cents for experienced workers in the southern California aircraft industry and somewhat higher increases for the Boeing plants in Washington. Action will be taken by the Board after opportunity is given for further statements.

At present the scale in southern California is 60 cents an hour for beginners, increasing to 75 cents after 12 weeks. He recommends 80 cents after 16 weeks, with a uniform employee advancement plan that would assure experienced hands 95 cents or more, making the average increase $6\frac{3}{4}$ cents an hour.

The unions asked for a minimum of 95 cents for workers after their apprentice period. The employers submitted the matter to the board without recommendations.

Cookhouses Included

- The federal circuit court of appeals has ruled that cookhouses of the Consolidated Timber Company at Glenwood, Ore., are governed by the fair labor standards act. The company contended that one of the cookhouses sold meals to the public as well as to company employees and should escape the act.

Stop Shifts In Textiles

LABOR shifting problems are being avoided in Seattle's clothing manufacturing and textile industry with a labor stabilization agreement evolved by a Seattle Chamber of Commerce committee in collaboration with employers within the industry and the Seattle Quartermaster Depot of the army.

Before December 1, twenty-nine holders of war contracts for textile industry products had agreed in writing to the agreement's provisions. Other such important industrial employers as the Boeing Airplane Company, several of the shipyards and the Civil Service Commission are wholeheartedly cooperating.

The teeth of the agreement, which imposes a code of ethics among employers that prevents the pirating of one firm's employees by another employer, are in the files of an industrial employment clearing house maintained by the chamber of commerce through a card index of each worker. Here is recorded employment data pertinent to the individual's employable status, principally whether he or she has received satisfactory release from previous employment which is required before being placed on the payroll of another employer. The employer promptly reports to the clearing house any termination of service of his employees and the circumstances involved.

In order to provide an equitable arrangement through the "clearance" records, the agreement further takes into account the employee who may have a special cause for leaving his employer and which might show a questionable release.

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In such cases provision has been made for a "special grievances committee" composed of representatives of the labor unions, the employers, the army and the chamber of commerce, which will make decisions affecting the questionable release.

Aircraft's Labor Turnover Problem

What aircraft plants are up against in trying to hold their forces together in the face of the draft was pointedly illustrated by H. Virgil Gaudette of Lockheed at the California State Chamber of Commerce conference at Los Angeles last month.

Lockheed has 11,600 single males employed. In October, 1942, 1,080 of its men (marital status not specified) enlisted and 239 were drafted. Requests for deferment had been submitted for 216 of these men.

When a senior mechanic who had been with Lockheed two years was drafted, six other employees in the same department enlisted shortly afterward, reasoning that they would inevitably be drafted also and so had better choose their branch of armed service for themselves. Fifteen employees in another department announced their intention of enlisting if a group leader whose deferment had been requested was drafted.

Mr. Gaudette also reported excessive labor turnover, 7 1/3 per cent in one month, which would mean 88 out of 100

employees not being with Lockheed a year hence if the present rates were continued for a year. The problem of recent origin, and 20 per cent of those who left in the month referred to above said they were "leaving the state because of homesickness or dislike of climate."

Ask For More

• Longshoremen of the Pacific Coast are asking raise to a minimum of \$1.25 an hour, the scale for East Coast longshoremen. Harry Bridges announces case will be taken to the War Labor Board. Present pay \$1.10 for six hours, time and a half for overtime. Waterfront Employers Assn. of San Francisco says average hourly earnings are \$1.40, average monthly \$275.

Scrap Shipped East

• As a result of the scrap drive, 35,000 tons of prepared iron and steel scrap in the West Coast area has become available for shipment to eastern mills. Signs of easing up in the supply of iron and steel are reported from many sources.

Hard to Reach

• Geneva Coal Mine, which will supply coal to the new Columbia Steel mill in Utah, has started production. Six and one-half miles of railroad, to haul coal from the mine to the plant through the wildest and roughest part of the great divide in the Wasatch Mountain range, were completed in 60 days. Most of the roadbed was cut out of solid formation of slate and rock.



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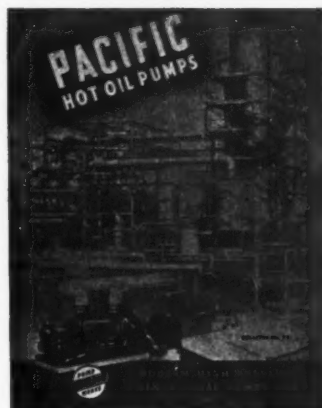
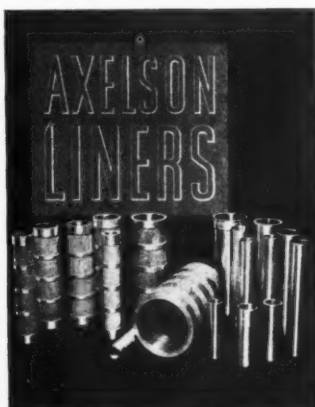
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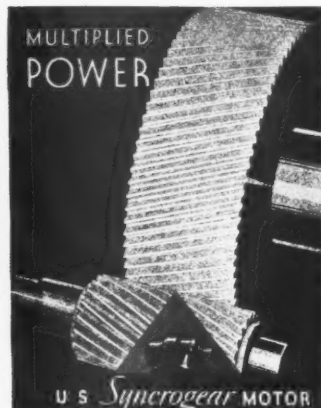
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ARIZONA

FENCING—Pacific Fence Co., 1012 No. Highland Ave., Los Angeles, has been awarded a negotiated contract by the U. S. District Engineer Office, Los Angeles, in an amount less than \$50,000 for construction of fencing at an airport in Navajo county.

SH-6 STOREHOUSE—McGinty Construction Co., 604 Luhrs Bldg., Phoenix, will construct a SH-6 Storehouse at an airfield in Maricopa county. Contract for less than \$50,000 by U. S. District Engineer, Phoenix.

ACID PRODUCTION—Inspiration Consolidated Copper Co., Inspiration, has a new sulphuric acid plant with a capacity of 3,000 tons of acid monthly.

INSTRUMENT AND ARMAMENT BLDG.—Del E. Webb Construction Co., 302 So. 23rd Ave., Phoenix, will construct an armament and instrument building at an Air Force Flying School in Yuma county. Contract for less than \$50,000 by U. S. District Engineer Office, Los Angeles.

HOUSING ADMINISTRATIVE PEOPLE—W. A. Beaubien, Phoenix, will construct housing for administrative personnel and two shop buildings at a reception center in Pinal county. Contract for less than \$100,000 by U. S. District Regional Engineer, Phoenix.

REWIRING BUILDING—E. L. Smith & Sons, 317 No. Laurel Ave., Los Angeles, were awarded a negotiated contract by the U. S. Engineer Office, Los Angeles, for rewiring a recreation building at a reception center in Yuma county. Cost less than \$50,000.

AIRFIELD HANGARS—Paddock Engineering Co., 2929 No. Fitzhugh, Dallas, has been awarded a \$200,000 contract by the U. S. District Engineer Office, Albuquerque, for construction of hangars at an airfield in Cochise county.

FENCE UNITS—Allied Contractors, 9700 West Pico Bldg., Los Angeles, will construct fence units at a recreation center in Yuma county. Contract, negotiated, by U. S. District Engineer Regional Office, Los Angeles, Calif.

HOUSING AND FACILITIES—Paul E. Griffin, 7219 Sepulveda Blvd., Van Nuys, will construct civilian war housing buildings, paving and utilities at a Basic Flying School in Pima county. Contract at \$100,000 by U. S. District Engineer Regional Office, Phoenix.

HANGAR BUILDING—Del E. Webb, 302-23rd Ave., Phoenix, will construct a hangar building at a flexible gunnery school in Mohave county. Contract for more than \$100,000 awarded by U. S. District Engineer Office, Los Angeles.

MESS HALL—J. S. Sundt, P.O. Box 2592, Tucson, will construct a civilian mess hall at an airfield in Pima county. Negotiated contract at \$50,000 by U. S. District Engineer Office, Los Angeles.

TRAILER UNITS—P. W. Womack Construction Co., P.O. Box 244, Phoenix, has been awarded a contract by the Federal Public Housing authority for the construction of 700 trailer units.

CALIFORNIA

FISH MARKET—Kemp Bros., 517 Broadway Bldg., San Diego, will construct a fish market building at the foot of Market St. in San Diego. The structure will be occupied by nine fish companies and will have offices, stores, refrigerating system, restaurant. Contract for \$52,850 by San Diego Harbor Dept.

MINING PLANT EXPANDS—Sierra Tungsten Co., Bakersfield, will expand their mining and milling plant in Greenhorn Mountain District, near Kernville, with installation of machinery and equipment to triple present output. Work to be under way soon is reported to cost close to \$100,000.

WATER PIER—Younger Construction Co., Cheda Bldg., San Anselmo, will alter Pier No. 25 owned by the General Engineering & Drydock Co., located at Battery and Lombard streets, San Francisco.

FOOD MACHINERY EXPANDING—Food Machinery Corp., West Alhambra St., San Jose, are building a \$200,000 addition to their plant, to be used mainly for manufacture of food processing machinery.

LAUNDRY ADDITION—L. P. Scherer and T. C. Prichard, 208 1/4 Orange St., Redlands, have been awarded a negotiated contract by the U. S. District Engineer Regional Office, Riverside, for construction of an addition to a laundry in Riverside county.

EQUIPPING TIN PLANT—Los Angeles Tin Corp., Los Angeles, will operate a plant which is being constructed and equipped by H. K. Ferguson Co., Cleveland, Ohio, at a cost in excess of \$1,500,000.

FIFTY BARGES—The Barr Lumber Co., Santa Ana, have been awarded a contract by the Maritime Commission for 50 barges to cost \$11,800 each.

PURCHASE FERTILIZER BLDG.—The Day and Night Mfg. Co., Monrovia, have purchased the Fuhr fertilizer building and 40 acres of property on Irwindale avenue, and are improving the building and adding new buildings. When ready to operate, the plant will hire about 80 people.

GLIDER DIVISION—The Chastek Mfg. Co., Los Angeles, will erect a new building to house a glider manufacturing division. The craft, designed by Robert L. White, will be built of plywood-plastic material with wood spars and ribs.

PROTECTIVE CONCEALMENT—G. A. Bell, 801 West Fifth St., Los Angeles, has been awarded a \$1,000,000 contract by the U. S. District Engineer Office, Los Angeles, for protective concealment in Los Angeles county.

OPERATING BASE—Guy F. Atkinson Co., 662 Russ Bldg., San Francisco, and George Pollock Co., P.O. Box 903, Sacramento, have been awarded a supplemental contract at \$14,131,008 by the Bureau of Yards and Docks, Navy Dept., Washington, D.C., for additional facilities at the fleet operating base in San Pedro.

RYAN CONSTRUCTING—B. O. Larsen, Pacific Highway, San Diego, will do general construction work of an office building and assembly building in San Diego for the Ryan Aeronautical Co. at a cost of \$450,000.

ALCOHOL ALLOCATED—Six million gallons of alcohol to be produced for the war effort has been allocated to the wine industry of California. The alcohol which should be produced in about three months will be 190 proof, suitable for making butelene, in turn used for making explosives.

PURCHASES HANGAR—Red Feather Products Co., Ltd., San Francisco, manufacturers of stencils and duplicator supplies, have purchased the Stinson Flying Corp. hangar on Bayshore Highway in Redwood City. Hangar is being remodeled for factory purposes, and it is estimated that between 40 and 50 persons will be employed.

HOUSING FOR BATTALIONS—Zoss Construction Co., 1037 No. Cole Ave., Los Angeles, will construct housing facilities for 13 anti-aircraft battalions, along with recreation buildings and appurtenant accommodations. Contract for more than \$1,000,000 by U. S. District Engineer Regional Office, Riverside.

TREATING ORE—The United States Chrome Mines, Inc., have ordered more equipment to double the capacity of their concentrating plant at the Pilliken chrome mine, and expect to handle more than 500 tons of ore daily. At present, they are treating 200 tons of chrome ore per day at their Grey Eagle property in Glenn county.

TIMBER PILE ENCASEMENTS—Cement Gun Construction Co., 24 California St., San Francisco, have been awarded a negotiated contract by the U. S. Army Engineer Office, District Engineer, San Francisco, for encasement of timber piles at a military location in Northern California.

MOTOR BASE—Alco Construction Co., 5423 Flemish Village Lane, Los Angeles, was awarded a negotiated contract in an amount less than \$50,000 by the U. S. District Engineer Office, for demolition and preparation of an Ordnance Motor Base in Los Angeles county.

WOOD HULL VESSELS—The Victory Shipbuilding Corp., Newport Beach, will construct wood hull vessels for the U. S. Navy at a cost of \$400,000.

FLOATING DRY DOCKS—Pacific Bridge Co., 333 Kearny St., San Francisco, have been awarded a supplemental contract at \$735,000 by the Bureau of Yards and Docks, Navy Dept., Washington, D.C., for timber floating dry dock at San Diego.

U. S. M. C. AIR BASE—James I. Barnes Construction Co., 1119 Montana Ave., Santa Monica, will build additional facilities at the Marine Corps air base under construction in Orange county. Contract for \$8,887,800.

PROTECTIVE WALL—San Diego Gas & Electric Co., Electric Bldg., San Diego, will construct a protective wall in San Diego county. Contract for \$50,000 by U. S. District Engineer Office, Los Angeles.

800 APARTMENTS—G. W. Williams Co., 10 California Drive, Burlingame, have been awarded a \$1,310,475 contract by the Richmond Housing Authority for the construction of 800 one-story, two-person war apartments in Richmond.

FLAT-TOPPING—P. J. Walker Co., 555 Flower St., Los Angeles, have been awarded a negotiated contract at \$1,000,000 for flat-topping in Los Angeles county. Contract by U. S. District Engineer Office, Los Angeles.

REMOVING PIPE—American Pipe & Construction Co., 4635 Firestone Blvd., Los Angeles, will remove pipe and appurtenances from the Pasadena pipe line and prepare for construction of the Orange county feeder extension for the distribution system of the Colorado River Aqueduct. Contract at \$798,033 by Metropolitan Water District, Los Angeles.

ALFALFA MILL REOPENS—Saunders Mill, Inc., formerly Alfalfa Mill, has reopened in Calipatria. Watson J. Dayton is superintendent.

SERVICE BUILDINGS—Jackson Bros.-LeSage, 547 So. Fairfax Ave., Los Angeles, will construct service buildings and training auditoriums for anti-aircraft battalions at a camp in Riverside county. U. S. District Engineer Regional Office, Riverside, awarded the \$500,000 contract.

CAMOUFLAGING—Foster and Kleiser Co., 1675 Eddy St., San Francisco, have been awarded a negotiated contract by the U. S. Army Engineer Office, District Engineer, San Francisco, for camouflage painting in the Bay area.

REMODELING BUILDINGS—Alco Construction Co., 5423 Flemish Village Lane, Los Angeles, will alter and make additions to buildings in Los Angeles county at a cost of \$500,000. Negotiated contract by U. S. District Engineer Office.

DRYDOCK—Poole & McGonigle, 6330 N.E. Halsey St., Portland, have been awarded a \$2,235,000 contract by the Bureau of Yards and Docks, Navy Dept., for construction of a timber floating drydock at Oakland.

PACKING HOUSE BUYS LAND—The Glueck Company, Sanger, have taken the title to property at Tenth and M streets on which their packing plant is located. E. J. Glueck, head of the company, says they plan to expand their facilities.

MATSON WAREHOUSE—Matson Navigation Co., 215 Market St., San Francisco, are having a one-story industrial building and warehouse built at southwest Bryant and Fremont streets. Estimated cost with equipment is over \$90,000.

PAINTING AND TEXTURING—John Colton, 719 Copeland Court, Santa Monica, has been awarded a negotiated contract by the U. S. District Engineer Office, Los Angeles, for painting and texturing in San Diego county at a cost of more than \$100,000.

CHEMICAL WAREHOUSE—J. A. Younger and H. A. Dutton, Jr., Cheda Bldg., San Anselmo, have been awarded a negotiated contract for construction of acetylene chemical and oxygen warehouse and oil storage warehouse at an airfield in Northern California.

PLANE PLANT BRANCH—The Consolidated Aircraft Corp., San Diego, have tentative plans to obtain a site in Laguna Beach for the establishment of a small parts manufacturing plant.

PLANT EXPANSION—Vultee Aircraft, Inc., Downey, has been granted approval by the Defense Plant Corp. for expansion of manufacturing facilities at a cost of \$350,000.

STEEL SECTIONS—Victory Manufacturing Co., San Jose, will manufacture steel sections for Henry J. Kaiser's ships. This company has taken over the plant formerly operated by the Adrian Mfg. Co.

MILLION DOLLAR BUILDINGS—M. J. King, 231 Franklin St., San Francisco, has been awarded a negotiated contract by the U. S. Engineer, Sacramento, for the construction of buildings in Northern California to cost \$1,000,000.

COLORADO

CONSTRUCTING WAAC FACILITIES—J. F. Roupe, 3434 East 17th St., Denver, will construct WAAC facilities including mess hall, officers quarters, barracks remodeling and administration building in Denver county. Contract by U. S. District Engineer Office, Denver.

NURSES' CENTER—E. B. Jones, Jr., 1010 So. Josephine St., Denver, has been awarded a contract by the U. S. District Engineer Office, Denver, for construction of nurses' recreation building in Denver county.

TWO SCHOOLS—Ralph Rippey, 1725 Sherman St., Denver, has been awarded the general contract by the War Relocation Authority, Denver, for the construction of two elementary schools and one junior-senior high school at Granada to cost \$310,000.

THREE HANGARS—Peter Kiewit Sons Co., Omaha, Nebr., has been awarded a supplemental contract by U. S. District Engineer Office, Denver, for the construction of three hangars, and frame construction as an extension to the present contract. Cost, \$100,000.

REMODELING WORK—Geo. O. Teats, 1701 No. Nevada Ave., Colorado Springs, has started remodeling a building into a recreation center. Contract by Federal Works Agency, Denver.

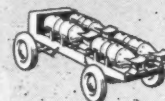
RUNWAY BASE—Arkwright Construction Co., La Junta, have been awarded a contract by the U. S. District Engineer Office, Denver, for a stabilized base for runways with oil preservative coat, in Otero county.

IDAHO

BUILDINGS—J. O. Jordan & Son, Boise, will construct buildings in Ada county at a cost of \$135,000. Contract by U. S. Engineer Office, Portland, Ore.

TO ERECT BUILDINGS—Vernon Bros. Co., Boise, will erect buildings in Power county at a cost of between \$200,000 and \$250,000. Contract by U. S. Engineer Office, Portland, Ore.

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THE WEST ON ITS WAY

MILITARY BUILDINGS—J. W. Brennan, Pocatello, will construct buildings at a military site in Power county. Contract for less than \$50,000 by U. S. Army Engineers, Portland.

MONTANA

HOUSING AUTHORIZED—Federal Public Housing Authority has notified the Montana Regional Office to begin construction of 200 houses for copper smelter workers at Anaconda.

WAREHOUSES—Victory Construction Co., Great Falls, have been awarded a contract by the U. S. Army Engineers, Fort Peck, for construction of warehouses at a military site in Cascade county, at a cost of less than \$50,000.

NEVADA

CARBONATE ZINC—Western Metals Co., 834 Thayer Ave., Los Angeles, will operate a new carbonate zinc plant to be located near Jean in Clark county. The Weal vaporizing process, covered by German patents which were seized by the federal government, will be employed. Granted \$341,000 by the Defense Plant Corp., output will be contracted to the Metals Reserve Co.

RADIO RANGE BUILDING—C. B. Bagnall, Box 176, Palos Verdes Estates, Calif., will construct a radio range building at a Flexible Gunnery School in Clark county. Contract, negotiated, at less than \$50,000, by U. S. District Engineer Regional Office, San Bernardino, Calif.

NURSES' BARRACKS—O. J. Scherer, P.O. Box 178, Angels Camp, Calif., will construct nurses' barracks in Clark county. Contract by U. S. District Engineer Regional Office, San Bernardino.

CONCENTRATING PLANT—Tungsten Associated Mines, Los Angeles, have taken a five-year lease on a tungsten mine located in the Patterson district, 50 miles north of Pioche, two miles west of Highway 93. They will construct a 50-ton concentrating plant.

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HEATING SYSTEM—O. J. Senum, 2646-29th St., Santa Monica, Calif., will install a heating system in a trainer building and armament cleaning building at a bombing and gunnery range in Nye county. Contract for \$50,000 by U. S. District Engineer Second Regional Office, Los Angeles.

CIVILIAN MESS HALL—C. B. Bagnall, Box 176, Palos Verdes Estates, Calif., has been awarded a \$50,000 contract by the U. S. District Regional Office, San Bernardino, for construction of civilian mess hall in Clark county.

SPEED TRAINER BLDG.—The General Construction Co., 5205 Hollywood Blvd., Los Angeles, will construct an Apparent Speed Trainer building in Clark county at a cost of \$50,000. Contract by U. S. District Engineer Regional Office, San Bernardino.

RAILROAD SPUR—Clifford C. Bong & Co., Six No. First Ave., Arcadia, Calif., will construct a railroad spur in Clark county. Contract for \$50,000 by U. S. District Engineer Regional Office, San Bernardino.

NEW MEXICO

AIRFIELD BUILDINGS—E. S. McKittrick Co., Inc., Carlsbad, have been awarded a negotiated contract at \$500,000 by the U. S. District Engineer Office, Albuquerque, for construction of additional buildings at an airfield in Eddy county.

STEEL HANGARS—K. L. House Construction Co., 214 E. Marquette, Albuquerque, will construct two prefabricated steel hangars in Otero county. Contract for less than \$100,000 by U. S. District Engineer Office, Albuquerque.

HOSPITAL BUILDINGS—Maxey & Leftwich, Lubbock, Texas, will construct hospitals in De Baca county. Contract for \$500,000 by U. S. District Engineer Office, Albuquerque.

WAR HOUSING—Harold W. Balay, 607 So. Solano Ave., Albuquerque, has been awarded a \$100,000 contract by the U. S. District Engineer Office, Albuquerque, for the construction of civilian war housing at an airfield in Lea county.

AIRFIELD BUILDINGS—P. J. Chambers, Roswell, will construct buildings at an airfield in Chaves county. Contract for less than \$50,000 by U. S. District Engineer Office, Albuquerque.

FUELING SYSTEM—De Luca & Son, 175 Filbert St., San Francisco, has been awarded a \$50,000 contract by the U. S. District Engineer Office, Albuquerque, for construction of a fueling system at an airfield in De Baca county.

CONSTRUCTING DEPOT—E. Montgomery, Taos, has been awarded a negotiated contract by the U. S. District Engineer Office, Albuquerque, for construction work at a depot in New Mexico.

14 T. O. BUILDINGS—M. M. Sundt Construction Co., 440 So. Park Ave., Tucson, will construct 14 theater of operations type buildings in Otero county. Contract for less than \$100,000 by U. S. District Engineer Office, Albuquerque.

OREGON

PRODUCING VENEER—The Olympic Manufacturing Co., Gresham, is producing veneer for airplanes.

MILITARY SITE—W. C. Smith & Co. and Kuckenbergh Construction Co., Portland, have been awarded a contract by the U. S. Army Engineers, Portland, for construction of buildings, roads, railway and utilities at a military site in Jefferson county to cost between \$600,000 and \$750,000.

BARGE-BUILDING—The Pointer-Willamette Co. will establish a branch plant in The Dalles for the construction of barges. A minimum of 250 men will be employed.

FRAME BUILDINGS—L. L. Quigley will construct frame buildings in Portland. The \$103,605 contract was awarded by the Portland U. S. Engineers Office.

MILITARY BUILDINGS—M. O. Bessonett, Medford, will construct buildings at a military site in Jackson county. Contract for less than \$50,000 by U. S. Engineer Office.

GARAGE—Tri-State Construction Co., Portland, will build a garage at a military site in Umatilla county. Contract for less than \$50,000 by U. S. Army Engineers, Portland.

THE WEST ON ITS WAY

MILLWORK FACTORY REOPENS—The Spaulding Logging Co., McMinnville, have reopened their plant, which was closed for the last five years. Howard Anderson, manager, says army, navy and lend-lease contracts totaling \$150,000, and calling for manufacture of tent poles and bulkheads, necessitated the reopening.

CREAMERY EXPANDING—The Farmers' Co-Operative Creamery plan to increase facilities for producing dry skim milk and whole milk powder for government outlets. Estimated cost is \$60,000.

TO ERECT BUILDINGS—A. Ritchie & Co., Baker, will construct buildings and appurtenant work in Umatilla county. Contract between \$175,000 and \$200,000 by U. S. Army Engineers, Portland.

UTAH

GRAVEL FILL—Victor Newman, 245 Williams Ave., Salt Lake City, has been awarded a negotiated contract by the U. S. District Engineer Office, Salt Lake City, in an amount in excess of \$100,000 for 200 c.y. of gravel fill in Tooele county.

MAGNESIUM PRODUCTION—The U. S. Metallic Magnesium Co., Salt Lake City, is preparing to start activities soon. They hold patents on chemical processes for recovery of magnesium.

HEATING WAREHOUSE—Corey & Joslin, Inc., 50 Hawthorne St., San Francisco, has been awarded a negotiated contract at \$50,000 by the U. S. District Engineer Office, Salt Lake City, for heating equipment for warehouses at a Quartermaster Depot in Weber county.

DENTAL CLINIC—Enoch Chytraus, 436 So. Fourth West, Salt Lake City, will construct a dental clinic at an air depot in Weber county. Contract for \$50,000 by U. S. District Engineer Office, Salt Lake City.

ADMINISTRATION BUILDING—Paul Paulsen Co., 551½ West First St., Salt Lake City, will construct a motor transport administration building at a fort in Salt Lake county. Contract for less than \$50,000 by U. S. District Engineer Office, Salt Lake City.

HOSPITAL ADDITION—Earl S. Paul, 2943 Harrison Blvd., Ogden, has been awarded a contract by Board of Trustees, Dee Memorial Hospital, Ogden, at \$250,000 for construction of a 112-bed addition to the Dee Memorial Hospital.

FIRE STATION—W. C. Smith, Inc., 216 Board of Trade Bldg., Portland, Ore., have been awarded a \$50,000 negotiated contract by the U. S. District Engineer Office, Salt Lake City, for construction of a fire station at a Quartermaster Depot in Weber county.

INSULATING WAREHOUSE—Johnson & Leck, 227 Eccles Bldg., Ogden, have been awarded a negotiated contract at \$100,000 by U. S. District Engineer Office, Salt Lake City, for installing insulation in a Quartermaster Depot warehouse in Weber county.

SQUADRON HANGAR—Robert E. McKee, 4700 San Fernando Road, West, Los Angeles, will construct a squadron hangar at an air depot in Weber county. Contract for less than \$500,000 by U. S. District Engineer Office, Salt Lake City.

BUILDING ALTERATIONS—Intermountain Securities Corp., First National Bank Bldg., Salt Lake City, have been awarded a negotiated contract by the U. S. District Engineer Office, Salt Lake City, for more than \$100,000, for construction of additional alterations to buildings at fairgrounds in Salt Lake county.

COMPLETING PLANS—Architects Miles E. Miller & Co. and Edward O. Anderson, Salt Lake City, are completing working plans for a new townsite and housing project to be erected near Sunnyside, Carbon county, for the Utah Fuel Co. and the H. J. Kaiser interests. The project includes dwellings, church, store buildings, markets, streets, utilities and landscaping.

WASHINGTON

\$8,000,000 CONTRACT—Howard S. Wright & Co., 407 Yale Ave., No., Seattle, and L. H. Hoffman, 715 S.W. Columbia St., Portland, Ore., have been awarded a negotiated contract for the construction of 2,650 housing units at Port Orchard. Contract for \$8,000,000 awarded by the FPHA Region Nine Office, Seattle.

STEAM SYSTEM—Zahniser & Warren, 609 Second, Spokane, have been awarded a contract for less than \$50,000 by the U. S. Army Engineers, Seattle, for installation of utilities steam and steam heating system in Spokane county.

COFFEE PROCESSING—General Construction Co., 3840 Lowa, Seattle, will construct a warehouse for a coffee processing plant in King county to cost less than \$50,000. Contract by U. S. Army Engineers, Seattle.

DRAINAGE SYSTEM—Leonard & Slate, Multnomah, Ore., has received a contract from the U. S. Army Engineers Office, Portland, for construction of a drainage system, grading and other miscellaneous work in Walla Walla county. Amount of contract is approximately \$200,000.

FRAME BUILDINGS—Sound Construction & Engineering Co., Northern Life Tower, Seattle, have been awarded a contract for the erection of temporary frame buildings at a military site in King county to cost between \$100,000 and \$500,000, by the U. S. Army Engineers.

RUNWAYS—Axel Osberg, 502 No. 62nd St., Seattle, has been awarded a negotiated contract by the U. S. Army Engineers, Seattle, for construction of runways, taxiways, hardstandings and truck road at a military site in Snohomish county to cost between \$500,000 and \$1,000,000.

LEASE MINING PROPERTY—The Pacific Nickel Co., Mount Vernon, has acquired leases on mining property in the Glacier Park area, near Darrington. One property is now in operation, according to P. A. Cornelius, one of the directors.

MORE MILITARY BUILDINGS—Moore & Roberts, Spokane, will construct miscellaneous buildings at a military site in Spokane county. Contract between \$100,000 and \$500,000 by U. S. Army Engineers, Seattle.

GASOLINE SYSTEM—Aqua Systems, Inc., 701 East Third St., Los Angeles, will construct a gasoline system at a military site in Thurston county. Contract, negotiated, at less than \$50,000 by U. S. Army Engineers, Seattle.

GARMENT FACTORY—U. S. Garment Co., Seattle, have made arrangements for a branch factory to be located at 255 East Main St., Auburn. They specialize in uniforms for defense workers, coveralls, and slack suits.

TO PRODUCE CULVERTS—The Washington Concrete & Pipe Co. has purchased land near the Standard Oil Co. tanks for the production of culverts for the air base near Moses Lake.

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THE WEST ON ITS WAY

GLUCOSE PLANT—The Northwest Chemurgy Cooperative has been organized in the Wenatchee area with Henry P. Earstensen as president, to promote construction of a glucose plant estimated to cost more than \$45,000.

SCHOOLS—Haddock Construction Co., 3538 E. Foothill Blvd., Pasadena, will construct school buildings on McLoughlin Heights in Vancouver. Contract for \$346,319 awarded by the Vancouver Housing Authority.

MISCELLANEOUS CONSTRUCTION—Sam Bergesen, Wick & Dahlgren, Clover Park, Tacoma, have been awarded a contract by the U. S. District Engineer Office, Seattle, for the construction of buildings in Snohomish county to cost less than \$50,000.

PIER TERMINAL—General Construction Co., 3840 Iowa, Seattle, will construct the substructure for North Pier Terminal at Connecticut St., Seattle, a cost of \$1,794,150. Contract by Seattle Port Commission.

THREE CONTRACTS—Washington Lumber Co., 3447 Fourth St., Seattle, have been awarded three contracts, each for less than \$50,000, by the U. S. Army Engineers, Seattle, for miscellaneous construction at military sites in Snohomish county.

CONVEYOR EQUIPMENT—Link-Belt Co., Pacific Div., Seattle, will install a coal conveyor system at a military site in Spokane county. Contract for \$50,000 by U. S. Army Engineers, Seattle.

BUILDING BARGES—The Pacific Woodenware Co., Marysville, have been awarded a contract for 50 barges by the Maritime Commission, Washington, D.C. Each barge will cost \$11,936.

ROAD TO MINE—Mt. Baker National Forest officials have announced at Bellingham that \$100,000 has been made available for extension of the Suiattle forest road to the Glacier Peak mine. The mine is being developed by the M. A. Hanna Co., Cleveland, Ohio.

SHIPYARD EXPANDS—Seattle-Tacoma Shipbuilding Corp., Tacoma, will be enlarged at a cost of several million dollars, according to O. A. Tucker, manager. The plant will build several new shops as well as warehouses and storage buildings.

FLOATING DRYDOCK—Puget Sound Bridge & Dredging Co., 2929 Sixteenth Ave., S.W., Seattle, will construct a \$1,500,000 floating drydock at Longview.

DRYDOCK CRANE—The Star Iron & Steel Co., Tacoma, has been awarded a \$119,000 contract for a 15-ton drydock crane for the Pearl Harbor navy yard.

CIRCUIT BREAKERS—Westinghouse Electric Mfg. Co., Portland, has been awarded a \$60,030 contract by the Bonneville Power Administration, Portland, for furnishing six 15-kv, 60-cycle oil circuit breakers for Mead.

RESCUE TUGS—The Bellingham Marine Railway and Boatbuilding Co., Bellingham, have received a contract from the Navy for six rescue tugs at a total cost of \$3,750,000.

OPPORTUNITY SECTION . . .

Priorities regulations have made it practically impossible to secure new machinery for industrial operations unless a plant is doing 100 per cent work on war projects. Even then, long delays are in prospect. The government is urging full use of existing machinery. Listed here are "machinery opportunities" immediately available here on the Pacific Coast.

SQUIRREL CAGE MOTORS IN STOCK

75 HP 3600 RPM 440-Volt Howell Ball Bearing
40 HP 1800 RPM 440-Volt Fairbanks Morse
40 HP 1800 RPM 220/440-Volt Northwestern
40 HP 900 RPM 440-Volt Type CS Westinghouse
35 HP 1800 RPM 440-Volt Type KT Gen. Electric
30 HP 900 RPM 220-Volt Type KT Gen. Electric
30 HP 1200 RPM 220/440-Volt Type ST U.S.
25 HP 900 RPM 220/440-Volt Type KT Gen. Elec.
25 HP 1200 RPM 220/440-Volt Type KT Gen. Elec.
25 HP 3600 RPM 220/440-Volt Type H Fair. Morse
20 HP 900 RPM 440-Volt Type ARX A. Chalmers
20 HP 1200 RPM 220/440-Volt Type CS West.
15 HP 900 RPM 220/440-Volt Type CS West.
15 HP 1800 RPM 220/440-Volt Type FR U.S.
10 HP 1800 RPM 220/440-Volt Type FR U.S.

SLIP RING MOTORS IN STOCK

75 HP 900 RPM 440-Volt Type HV Fair. Morse
30 HP 900 RPM 440-Volt Type FRVI, U. S. Intermittent
22 HP 1200 RPM 440-Volt Type FRVI U. S. Intermittent
1½ HP 1200 RPM 220-Volt Type MT Gen. Elec.

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MACHINERY SALE MOTORS

- 1—260 H.P. Synchronous G.E. 225 RPM, 2200 volts, 210 KVA.
- 2—250 H.P. Westinghouse, Type CS, 290 RPM, 2200 volts.
- 1—200 H.P. Slip Ring G.E. 600 RPM, 440 volt motor.
- 1—200 H.P. G.E. Type I, 600 RPM, 440 volts.
- 1—200 H.P. G.E. 1800 RPM, 440 volt motor.
- 1—150 H.P. Westinghouse, Type CS, 1800 RPM, 440 volts.
- 1—100 H.P. Slip Ring, G.E., 720 RPM, 440 volts.
- 1—62½-ft. 25½-inch Double Leather Belt.
- 1—60 H.P. G.E. Type I, 1800 RPM, 440 volts.
- 1—50 H.P. Vertical Fairbanks Morse, 1200 RPM, 220 volts, solid shaft.
- 1—35 H.P. Crocker Wheeler, 1200 RPM, 220 volts.
- 1—25 H.P. G.E. Type I, 600 RPM, 220 volt motor.
- 1—10 to 30 H.P. Slip Ring, Westinghouse, Type MW, 860 RPM, 440 volts.

GENERATORS, BLOWERS, WATER PUMPS

- 1—600 Amp, 7500 volt, Westinghouse Type F3 oil circuit breaker.
- 1—300 H.P. Triumph Water Wheel with governor, 50 ft. head.
- 1—200 KW. Westinghouse Alternating Current Generator, 900 RPM, 440 volts, 60 cycle, 3 phase.
- 1—150 H.P. Fairbanks Morse, Type B, 720 RPM, 440 volts.
- 1—150 H.P. Westinghouse Type CS, 720 RPM, 2200 volts.
- 1—No. 70 ILG Blower, 17,430 CFM, direct to 6 H.P. 340 RPM, 3 phase motor.
- 2—75 KVA Transformers, G.E. Type H, 6600 to 120/240/480 volts, 60 cycle.
- 1—50 H.P. Single Drum Mine Hoist.
- 1—45 K.W. Alternating Current Generator, U.S. Electric, 1200 RPM, 440 volts, 3 phase.

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- 3—1½ K. V. A. Westinghouse
- 2—2 K. V. A. Westinghouse
- 4—3 K. V. A. Westinghouse
- 4—5 K. V. A. Westinghouse
- 3—10 K. V. A. General Electric

Single Phase, 50 or 60 Cycle 2200 to 440/220 Volts

- 1—7½ K. V. A. Westinghouse
- 3—10 K. V. A. General Electric

Single Phase, 50 or 60 Cycle 440 to 220/110 Volts

- 4—1½ K. V. A. Westinghouse
- 8—3 K. V. A. Westinghouse
- 12—5 K. V. A. Westinghouse
- 4—7½ K. V. A. Westinghouse
- 3—10 K. V. A. Westinghouse
- 1—37½ K. V. A. Westinghouse

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WESTERN TRADE WINDS

NEWS ABOUT THOSE WHO DISTRIBUTE AND
SELL INDUSTRIAL EQUIPMENT AND MATERIALS

Western Gear Works, 417 Ninth Avenue South, Seattle, Wash., held a dinner for their entire group of foremen, department heads and lead men, at which Thomas J. Bannan, executive vice president and general manager, announced changes of personnel. Harold Niemeyer, plant superintendent at Seattle was made general superintendent of both the Seattle and Lynwood plants, with headquarters at Lynwood. He

will be assisted as general foreman by Tony Danning. Al DeArmand takes Danning's place and DeArmand will be succeeded by Bill Neff.

Promotions in the Seattle plant were given to Royal Hawley, former assistant to Niemeyer, and to Kenneth McBain, stores supervisor. These men will act for Mr. Niemeyer in his absence.



• Western Gear Works' executives. From left: Al DeArmand, Royal Hawley, Harold Niemeyer, T. J. Bannan, Tony Danning, and Kenneth McBain.

Safety instruction has been brought to industrial workers in California right on the job itself by means of the safety instruction car sent out by B. F. McDonald Company. Care and use of safety appliances are being demonstrated and explained by company representatives who are accredited Bureau of Mines instructors in both mine rescue and first aid.

The car is a specially built truck, carrying equipment mounted on panels for easy display, and equipped inside to include hose masks, oxygen breathing apparatus, etc., so that they can be actually demonstrated.

A regular course was worked out and instruction given last fall to groups of foremen and employees in defense industries in southern California, in the oil fields and

around San Francisco Bay. A further itinerary has been planned for the coming season. Among the instructors participating were B. F. McDonald, R. A. Stayer, W. E. Cornelius, Stan Tolley, H. E. Douglass, K. S. Butler, W. E. Russell and M. Witzell.



• W. E. Cornelius demonstrates hard hats to a shipyard safety man. W. E. Russell at the wheel.

Microstat Corp., of Norwalk, Conn., have established a plant at 1240 South Main St., Los Angeles. The company offers precision microfilming service to war industries and others with valuable files, engineering drawings and documents which they wish duplicated. Jesse R. Mayers is general manager.

E. L. Mathy, vice president of Victor Equipment Co., San Francisco, is on the board of directors of the International Acetylene Association for the coming year.

The J. Herman Company, 1349 E. Vernon Ave., Los Angeles, heating, ventilating and air conditioning contractors, have celebrated their fortieth business anniversary. Established in St. Louis in 1902, a plant was opened in Los Angeles in 1921 on Towne Avenue; and in 1932, they moved to their present address.

National Cylinder Gas Co. has opened an office in San Francisco located at 326 Howard St. They will stock Hollup Sureweld welding electrodes, Hollup electric welding equipment, Torchwell gas welding and cutting equipment and a diversified line of welding accessories.

H. L. Harvill Co., 2223 East 37th St., Los Angeles, has been organized by H. L. "Red" Harvill, who announced his reentrance into the field of aircraft and die castings. The company will specialize in centrifugal, pressure and die castings as well as permanent moulds. Associated with Mr. Harvill are: R. C. Beck, chief engineer; Adolph Oswald, permanent mould design; S. I. Gleason, metallurgist, Dale Norton, casting foreman; L. W. Johnson, office manager; M. C. Goodfellow, purchasing.

YOURS FOR THE ASKING

1158

• **Wood Plastic and Putty**—The wood plastic is for filling large cavities (drill holes, broken corners) and goes on in one application. The putty is a quick-drying, high-speed surfacer for filling and glazing over smaller imperfections (scratches, nicks, hammer dents). Both bond to woods, plastics, metals, fabrics, tile and other commonly used materials. Waterproof and weatherproof, so can be used outside as well as in. Eight-page booklet and trial cans available from *Webb Products Co., Inc.*, 200 So. G St., San Bernardino, Calif.

1169

• **V-Belt Drives**—"23 Ways to Conserve the Life of Your Multiple V-Belt Drives" is a contribution to the rubber conservation movement. Its purpose is to educate power users in the proper procedure of selection, installation and maintenance of Multiple V-Belt Drives. Written and illustrated in a non-technical language. *Multiple V-Belt Drive Assn.*, 140 So. Dearborn St., Chicago, Ill.

1170

• **Motor Fitness**—Subject of a 40-page bulletin GED-1017. Although primarily intended for plants converted to war production, the bulletin will prove valuable in all plants in which motors are widely used. Discusses how to get the most service out of old and new motors, "switching" motors from one job to another, and equipping old machines with new motors. Arranged throughout for quick reference. *General Electric Co.*, 235 Montgomery St., San Francisco, Calif.

1171

• **Automatic Shaping**—"Duplomatic Simplifies Difficult Contour Shaping Operation" is the title of a bulletin which describes how Duplomatic, an automatic machine tool control, permits standard shapers to do high-speed automatic shaping. According to the manufacturer, this set-up eliminates the necessity for extensive rebuilding of original standard shaper. *Detroit Universal Duplicator Co.*, 723 E. Milwaukee Ave., Detroit, Mich.

1172

• **Special Pencil**—Black-graphite pencil, soft enough to be legible on the top sheet, yet makes clear and legible multiple carbon copies without cutting through the original. Strong enough to withstand the necessary pressure for copying work. One No. 700 Duro Lead Manifold Carbon Copy Pencil available from *Reliance Pencil Corp.*, Mount Vernon, N. Y.

1173

• **Calendar**—An engineers' and draftsmen's calendar with extra large figures relative to the decimal equivalent chart. It is visible in the average drafting room. Printed in red and black on a white background. Two sizes: 12 by 15 inches and 7 by 9½ inches. *Dayton Rogers Mfg. Co.*, 2835 Twelfth Ave., So., Minneapolis, Minn.

1174

• **Ventilating Systems**—"It Fights Its Second War" contains 42 photographs picturing the use of self-cooled motor propeller fans, universal blowers and unit heaters, in both World War I and World War II. *Ilg Ventilating Co.*, 2850 No. Crawford Ave., Chicago, Ill.

1175

• **Food Plant Cleaning**—Discusses in detail the cleaning problems connected with practically all the divisions of the food producing and packing industry, with the exception of the dairy and bakery industries. Book is divided into nine sections. Illustrated with photos of actual cleaning operations. *Magnus Chemical Co., Inc.*, Dept. F, Garwood, N. J.

1176

• **"California Redwood"**—Its Properties and Uses" is the subject matter of a bulletin which discusses the physical, mechanical and chemical properties of redwood. It is pointed out that it is resistant to decay and insect attack; it has a higher bending strength, crushing strength and

You owe it to yourself to keep posted—only the efficient business survives under the strain and pressure of the war effort. Literature listed in these columns may be just the answer to your need for greater production, substitute materials or knowledge of how to care for your equipment. Just drop a note to Western Industry, 503 Market St., San Francisco, and copies will be forwarded to you. If you do not use business letterheads, please name your company affiliation.

hardness; exhibits extremely low shrinkage or swelling under variable conditions of moisture; resists action of solutions, including definite percentages of organic and inorganic acids and alkalis; shows high fire resistance and ranks among the highest of commercial woods in insulating values. *California Redwood Assn.*, 405 Montgomery St., San Francisco, Calif.

1177

• **Laminated Solenoids**—Designed for specification by engineer-designers for hydraulic valves and general industrial purposes. Maximum magnetic force for given electrical input is effected by design, laminated frame and plunger. Coils may be paper section wound, cloth-taped and treated to make impervious to cutting oils and coolant. Installation is easy for either direct or remote control and quick short thrusts. Bulletin from *Dean W. Davis & Co.*, 549 West Fulton St., Chicago, Ill.

1178

• **Bonding Ring**—May be used wherever there is a need for bonding between electrical plug shell and wire shielding, and may be used with either flexible conduit coupling nut or cable clamp. At present, ring is used almost exclusively in bonding shielded radio and instrument circuits, but it is adaptable to many other applications where a tight bond is required. Bulletin from *Cannon Electric Development Co.*, 3209 Humboldt St., Los Angeles, Calif.

1179

• **Rotary Pump**—Bulletin 118 describes the Granco rotary positive displacement pump with automatic variable delivery control and with built-in surge valve and outboard ball bearing. Especially designed for regular and aviation gasoline, and according to the manufacturer, is the ideal pump for dispensing gasoline to planes, tank fleets, marine terminals and other equipment depots. *Granberg Equipment, Inc.*, 1308-67th St., Oakland, Calif.

1180

• **Heavy Equipment**—"Whiting Products for Industry," a 24-page picture book, gives a comprehensive study of Whiting's service to industry with condensed, pertinent facts on its varied lines including cranes, railroad and aviation equipment, cupolas and foundry equipment, quickwork products, swenson evaporators and filters. Bulletin No. 236. *Whiting Corp.*, Harvey, Ill.

1181

• **Milling Machine**—Versatility of the Fray Ram Type No. 7-B Vertical Universal Milling Machines is described graphically in a new catalogue. Explains how any angle operation in both the vertical and horizontal planes is provided without changing the work set-up by traversing the ram on the turret slide or by operating the ram in its saddle. *Fray Machine Tool Co.*, Glendale, Calif.

1182

• **Lighting**—"On the Land, On the Sea, and in the Air" is the theme of a 20-page brochure which illustrates and describes how good lighting and the near infra-red process are speeding the production of war materials used in these three phases of warfare. Flashes No. 1402 from *Fostoria Pressed Steel Corp.*, Fostoria, Ohio.

1183

• **Plastic Parts**—Leaflet illustrates some of the parts problems solved by manufacturing with plastic. New fabricating techniques developed can help solve difficult production problems, according to *Creative Plastics Corp.*, 963 Kent Ave., Brooklyn, N.Y.

1184

• **Chip Breakers**—Bulletin 442, entitled "Chip Breaker Designs," contains the correct types of chip breakers and how to achieve them for various jobs. Included are diagrams. *McKenna Metals Co.*, 196 Lloyd Ave., Lutrohe, Penn.

1185

• **War Gas Extinguisher**—A dry chemical fire extinguisher also effective as a decontaminator for the three major war gases—chlorine, phosgene and chloracetophenone (tear gas). Folder illustrates use. *O. H. Adams Co.*, 2018 E. Thomas Ave., Milwaukee, Wis.

1186

• **Vigorator**—Peps up workers, relieving fatigue, tiredness and foot discomfort by vibratory massages. Leaflet illustrates and explains use of machine. *A. T. Cave Co.*, 6100 Avalon Blvd., Los Angeles, Calif.

1187

• **Pipe Protection**—A ten-page folder illustrating and describing seal-caps and seal-plugs. Actual uses of this product are shown, too. Thirteen reasons are given why these items are the most effective method of protecting and sealing tubing, threaded fittings and hydraulic units. *Tubing Seal-Cap, Inc.*, 215 West Seventh St., Los Angeles, Calif.

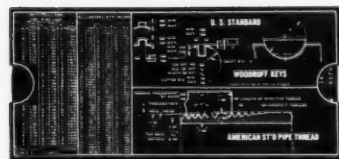
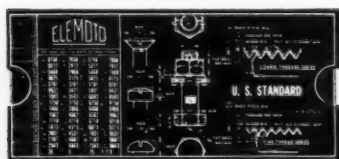
THE SHOWCASE

• **Air Clamp**—For operations involving the joining by welding, riveting or bolting of two or more component parts of any assembly. Can be operated by a single master valve, whether there be two or several hundred in the operation involved. The



"lock-up" and "release" of assemblies is instantaneous. Compact size permits installation in cramped corners. Delivers 80 pounds of pressure on a line pressure of 100 pounds. Stroke of ram is $\frac{3}{8}$ inches. An internal return spring withdraws the ram when air is exhausted from the cylinder by the control valve. *Mead Specialties Co., 15 So. Market St., Dept. 33, Chicago, Ill.*

• **Elemoto Slide**—A calculating instrument which assures accuracy of dimensions. Front side shows U. S. Standard dimensions for coarse and fine thread series. Back side is used to obtain dimensions for U. S. Standard (and smaller commercial sizes) for Woodruff Keys. Lower section is used to determine American Standard Pipe

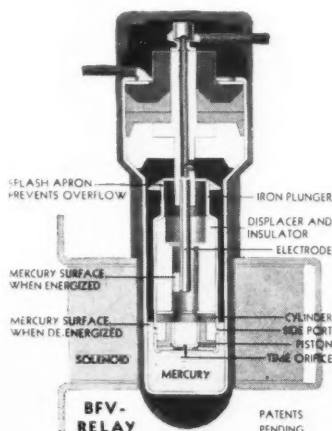


Thread dimensions. Made of durable heavy-gage coated paper board. Drawings and figures appear in clean white lines against a blue background. *The Elemoto Sales Co., Teaneck, N.J.*

• **HEAVY-DUTY CASTER**—Eight and ten inch casters which embody structural features especially adaptable to materials-

handling problems found in aviation and other war production plants. Top plate and swivel head of caster are made of steel forgings while legs, or forks, are designed of heavy bar stock securely welded to swivel head. Shape of fork and method of designing is new feature of caster which more than doubles its strength. *Rapids-Standard Co., 535 Bond Avenue, N.W., Grand Rapids, Mich.*

• **Time Delay**—The BFV type, illustrated, delays its action upon closing of the control circuit, and after such delay, closes the main line circuit; and upon opening of the control circuit, the main line follows instantly to an open position. To keep the



time delay settings accurate, it is important that no burning apart of the contacts shall occur. Also can be used in communication systems, in machines, motors and electrical circuits where time intervals are required at the beginning or at the end of the cycle. *Durakool, Inc., 1010 No. Main St., Elkhart, Ind.*

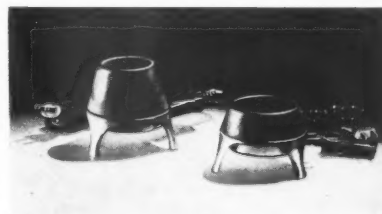
• **Hair Guard**—A protection for women drill press operators, assembly line workers and in some inspection jobs. Keeps hair in place and saves time otherwise spent in brushing hair off the face, as well as keeping hair clean. The transparent non-flam-



nable visor serves as a warning bumper, lets in additional light, and doesn't show grease or dirt marks. *Standard Safety Equipment, 232 West Ontario St., Chicago, Ill.*

• **Wood Locker**—An all-purpose locker to fit every locker need. Uses no critical materials. All parts pre-fit for quick, easy installation. Each locker consists of paneled ends, back panel, front panel including door, bottom shelf, hat shelf, top and divider partition. *Curtis Companies Service Bureau, Curtis Bldg., Clinton, Iowa.*

• **Solder Pots**—For continuous operation in radio, motor and similar electrical equipment plants where individual soldering melting pots are desired for each operator



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SHOWCASE (Cont'd from preceding page)

or for small repair and homecraft shops. Consists of a cast iron pot, mounted by a single screw on a plated steel stand. A single heat, porcelain nickel-chrome heating element, which is replaceable, heats the pot. *Lectrohm, Inc., 5125 W. 25th St., Cicero, Ill.*

• **Electric Etcher**—For etching everything from thin, delicate metal parts to large, smooth castings. Parts are placed on work plate, switch turned on to proper

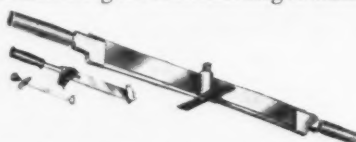


heat and operator starts writing. Regardless of the hardness of the tool or part, machine works easily. *Ideal Commutator Dresser Co., 4134 Park Ave., Sycamore, Ill.*

• **Insulated Bobbins**—Much higher corrosion resistance in bobbins for coil windings has been achieved by construction in which cellulose is embodied in the bobbins. Cellulose acetate is used in combination with the spiral-wound dielectric fish-paper core and vulcanized fibre flanges. Spiral wound laminations of cellulose acetate are made over a die to the O.D. of the core, and then with a press-fit, slipped over the core to form a spacing tube. The length of the acetate determines the winding area. The inside faces of the fibre flanges are laminated with cellulose acetate before die-cutting, the core then swaged, locking the flanges in place onto the core carrying the spacing tube. Acetate cement is brushed over the joinings to give complete protec-

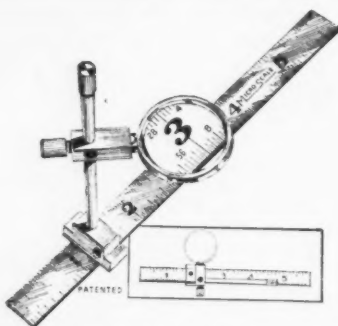
tion and to strengthen the bobbin. *Precision Paper Tube Co., 2033 W. Charleston St., Chicago, Ill.*

• **Measuring Wrenches**—Used for gauging or measuring torsional force, as when equalizing the set of screws or nuts by tightening to a predetermined torque, or for measuring the frictional drag in motors



or mechanisms. Widely used in both manufacturing and inspection departments. All are of the flat tapered beam type with fixed end and top scales and are guaranteed to retain accuracy, according to *The P. A. Sturtevant Co., Addison, Ill.*

• **Micro Scale**—A magnifying machinist scale with which the tool maker can see such fine divisions as 1/64 about four times its normal size. Permits him to work to a few thousandths since he can split 1/64 with his scribe. Scale is so constructed that



it lies flat on the surface black, has an unbreakable plastic lens which focuses and slides along the scale, and can be carried flat in the pocket. *L. V. Fox, Inc., Dept. 3, Woodward Bldg., Washington, D.C.*

• **Hardening Steel**—Known as the Tocco process, the hardening is accomplished by the process of electric induction heating and quenching with water. Machine takes

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six shafts at one time. When a shaft is dropped by the operator into an inductor block in the machine, the hardening is carried on automatically. A cam holds the shaft in such a position that an inductor surrounds each of the three-bearing surface area. *Tocco Division, The Ohio Crankshaft Co., 3800 Harvard Ave., Cleveland, Ohio.*

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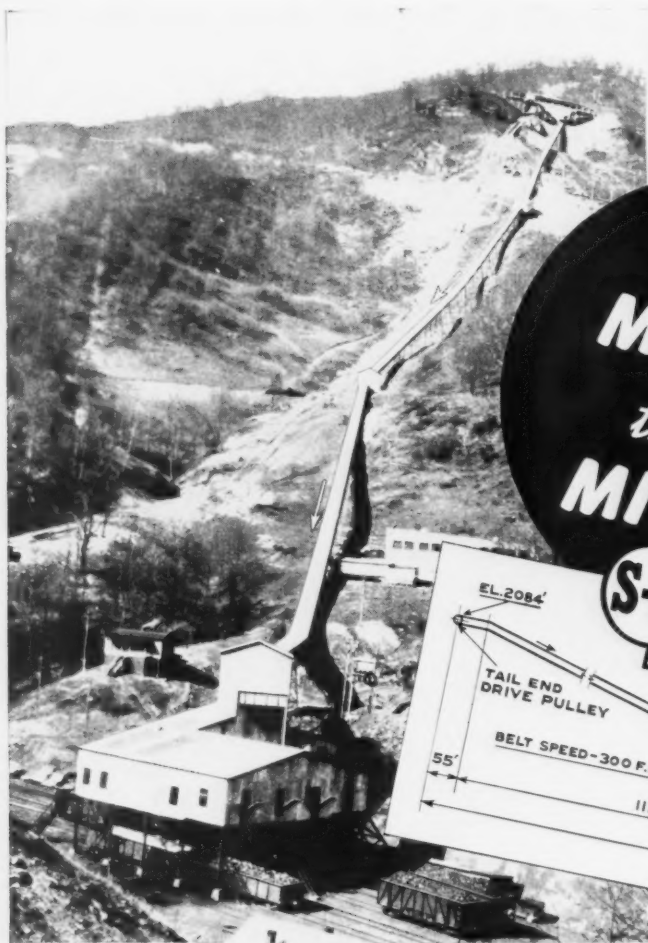
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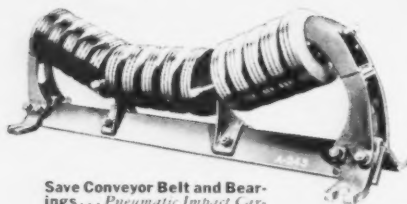


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